RD/RA Year 8 Annual Report For The UniFirst Site

Remedial Action at the Northeast Quadrant of the Wells G & H Site, Woburn, Massachusetts

Groundwater Extraction, Treatment, Monitoring & Capture System Performance

Prepared for:
UniFirst Corporation
68 Jonspin Road
Wilmington, MA 01887

Submitted to:
U.S. Environmental Protection Agency
Region I

Prepared by:
Harvard Project Services
325 Ayer Road, Suite B-201
Harvard, MA 01451

November 15, 2000

Harvard
Project
Services

Via U.S. Mail

November 13, 2000

Mary Garren
Remedial Project Manager
US EPA – Region I
1 Congress Street
Suite 1100 (HBO)
Boston, MA 02114-2023

Re: Year 8 Annual Report, UniFirst Corporation
Wells G&H Site, Woburn, MA

Dear Ms. Garren:

On behalf of UniFirst Corporation, I am submitting the report "RD/RA Year 8 Annual Report for the UniFirst Site."

Should you have any questions, please call.

Sincerely,

Timothy M. Cosgrave
Project Manager

TMC:hs
enclosure

cc: Anna Mayor, BWSC, DEP
Robert Donati, Foster Wheeler
Greg Bibler, GPH
Jamie Greacen, ThermoReTec Consulting
Susan Brand, Cummings Properties
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1 INTRODUCTION

This document is the eighth Annual Report for the UniFirst Remedial Action, prepared pursuant to the Consent Decree (Civil Action No. 91-11807-MA) Statement of Work, Section VIII (B) (5), as further described in the "Operation and Maintenance Plan - the UniFirst Site", dated February 1, 1993, and revised March 1994. This Annual Report describes operation of the groundwater extraction and treatment system during the period of October 1, 1999 to September 30, 2000. In addition, the report summarizes and discusses the results of the water-level measurements and water-quality analyses from wells on the UniFirst property, and west and south of the UniFirst property, used to monitor the effects of pumping from well UC-22 (the recovery system).

AO, Inc. was responsible for system operation from October 1, 1999 to January 1, 2000. Harvard Project Services (HPS) assumed responsibility for the system from January 1, 2000 and is the principal author of this document. All data and field documentation collected during the operation of the system, such as field sheets, sample logs, data files, and laboratory reports, are being maintained in the offices of HPS and previous contractors responsible for operation of the system (AO, Inc., The Johnson Company, ENSR Consulting & Engineering, Inc. and Handex of New England, Inc.).

1.1 Background and Objectives

Treatment System

The purpose of the groundwater extraction and treatment systems installed and operated on the UniFirst and Grace properties is to address the remedial objectives for contaminated groundwater as stated in the Consent Decree:

- Prevent the further introduction of contaminated groundwater from the source areas to the Central Area;
- Limit the further migration of contaminated groundwater off-site from the source areas;
- Restore the bedrock and overburden aquifers in the vicinity of the source areas to drinking water quality; and
- Prevent public contact with contaminated groundwater above the Cleanup Levels.

Based on these objectives, UniFirst and Grace started integrated groundwater pumping and remediation systems on the UniFirst and Grace properties on September 30, 1992. The combined UniFirst/Grace groundwater pumping and remediation program consists of two extraction and treatment systems that work in concert. The recovery system on the Grace property presently consists

of 16 wells that pump groundwater from the unconsolidated deposits and upper bedrock. On December 3, 1997 pumping from Grace recovery wells RW1 through RW6 was stopped in accordance with the EPA approved revised recovery well operation plan. Grace has prepared a separate annual report on the recovery system on the Grace property. That document is entitled *W.R. Grace Remedial Action Wells G&H Site, Woburn, Massachusetts, Annual Report for October 1, 1999 to September 30, 2000* prepared by HSI GeoTrans, Inc., and submitted to the EPA under separate cover.

Capture System

The recovery system on the UniFirst property consists of a single well, UC22, which pumped groundwater from the bedrock at an average rate of 38 gallons per minute (gpm) during Year 8. This well is located at the northeast corner of the UniFirst property. Its total depth is 190 feet below ground surface with an open interval of 175 feet in bedrock. The pump is set at approximately 175 feet below the ground surface.

When UC22 pumping began on September 30, 1992, 91 well points at 35 locations were monitored for water levels quarterly, and seven wells contained data loggers. By February 1995, a total of 116 well points were monitored quarterly for water levels and data loggers were installed in four additional wells. These data were presented on a table, 91 hydrographs, five potentiometric cross sections, and two potentiometric surface maps in quarterly and annual reports for Years 1, 2, and 3.

In August 1996, EPA approved additional modifications to the Long Term Monitoring Program (LTM Program). These modifications included a shift to annual monitoring of the well network and changes to the number and locations of wells sampled and monitored for water-level elevations. Table 1 presents the current monitoring wells sampled annually each spring, and Table 2 provides a list of wells measured in the spring water-level monitoring program. Table 3 summarizes the depth and screened elevation of the monitoring wells discussed in this report.

Year 8 Modified Activities

The LTM Program for the period October 1999 through September 2000 was implemented as described in the approved plans.

Report Contents

This report contains the extraction and treatment system and monitoring well data collected during the eighth year of operation of the UniFirst groundwater extraction and treatment system. Section 1.0 provides a general background and objectives with a yearly update of modified activities.

Section 2 of this report evaluates the area of groundwater capture in the bedrock and unconsolidated deposits. Potentiometric maps of the April 2000 water-level measurements are presented in

Appendix A. Water-level measurements recorded in 2000 are presented in tables and hydrographs in Appendices B and C.

In addition to the usual five potentiometric cross sections reported for a given water-level measurement event, an additional more detailed potentiometric cross section is presented in Appendix A at two different vertical exaggerations. This additional cross section includes a greater number of monitoring wells for the purpose of illustrating groundwater capture in the unconsolidated deposits at the western boundary of the UniFirst property.

Section 3 describes water quality observations in the VOC data. The 2000 data are presented in Appendix D and a concentration distribution map in Appendix A.

Section 4 evaluates the groundwater extraction and treatment system performance. This section further discusses the water quality for the influent and discharge, groundwater pumping rate, recovery well water level elevations, contaminant mass removal, and the overall performance of the system's components.

Section 5 summarizes the operation and maintenance of the groundwater extraction and treatment system. It includes a discussion of system downtime, energy and chemical usage, and maintenance and repairs conducted during Year 8.

Section 6 includes recommendations regarding the continued monitoring of the system and provides brief conclusions.

Project Team Organization

Harvard Project Services (HPS) has been UniFirst's contractor for operation of the treatment system since January 1, 2000. HPS supervises the operations and prepares the monthly and annual reports. For the first quarter of Year 8, AO, Inc. was the contract operator with HPS providing supervision and reporting. The Johnson Company continues to provide technical assistance in the capacity of Design Engineer and Hydrogeology Consultant by preparing Sections 2 and 3 and Appendix A of this report. Calgon Carbon Corporation, the manufacturer of the Ultraviolet/Chemical Oxidation process unit (UV/Ox unit) provides ongoing maintenance and troubleshooting services for the UV/Ox unit under a separate service contract. B.C. Plumbing & Heating, a plumbing contractor continues to provide, as needed, emergency response and trouble-shooting services.

Katahdin Analytical Services, Westbrook, Maine continued to provide laboratory services for the eighth year of operation. As was done in 1999, UniFirst hired HSI GeoTrans, which has worked for Grace and UniFirst in many capacities for many years on the Wells G&H Site, to undertake the water-level measurements and ground water sampling that are part of the Long-Term Monitoring Program. Quality assurance for the project, as set forth in the Quality Assurance and Quality Control Plan, continues to be monitored by ECCI of Windham, Maine.

Environmental Project Control, Inc., Westford, Massachusetts, is UniFirst's Project Coordinator for Consent Decree-related matters.

2 GROUNDWATER CAPTURE EVALUATION

2.1 Bedrock

A review of the potentiometric maps and cross sections presented in Appendix A show an extensive vertical and horizontal area of groundwater capture in the bedrock. With the exception of brief periods of treatment and pumping system down time, this capture has been maintained beyond the UniFirst and Grace property boundaries throughout the eight years of operation.

The water-level data table indicate that in most monitoring wells, the highest and lowest recorded water-level elevations for the period September 1992 through April 2000 occur in approximately April and November, respectively. The capture area throughout the eighth year of monitoring extends approximately 1,000 feet south of UC22 as shown by water-level elevations measured in UG1 and UC12, and more than 400 feet vertically, as shown by water-level elevations measured in UC23 and well nest UG1. The potentiometric maps and cross sections in Appendix A illustrate the extent of groundwater capture. These maps and cross sections show that groundwater capture extends beyond the UniFirst property boundaries.

One bedrock monitoring well (pumping well UC22) contained a data logger and transducer during the eighth year of monitoring. The hydrograph for this well, presented in Appendix C, shows that in the eighth year the highest groundwater elevations occurred at the end of April and the lowest levels were maintained during the period October 1999 through January 2000 and again in September 2000.

2.2 Unconsolidated Deposits

In addition to the five potentiometric cross sections (Figures 1A through 1E), two additional potentiometric cross sections (Figures 1F and 1G) illustrate capture of all contaminated groundwater flow from the UniFirst property and its western boundary by pumping well UC22. These two cross sections, P-P' at vertical exaggerations of 5:1 and 2.5:1, are presented with an interpretation of the April 2000 water-level data. These two cross sections, and the five-potentiometric cross sections presented, show that all contaminated groundwater on the UniFirst property is captured by the groundwater extraction system.

Since the initiation of the extraction and treatment system in September 1992, twenty-two monitoring wells have been installed in the unconsolidated deposits on the UniFirst property. Hydraulic data developed from these additional monitoring wells have supported the assessment of contaminated groundwater capture on the UniFirst property.

Two monitoring wells in the unconsolidated deposits contain data loggers and transducers for water-level monitoring. These two wells, UC6 and UC6S, are located on the downgradient end of the

UniFirst property. The hydrographs for these two wells, provided in Appendix C, show an increasing curve during the spring and decreasing curve during the fall that is consistent with the seasonal trend. The hand measurements closely follow the data logger record.

3 ANALYTICAL DATA EVALUATION

Groundwater sample collection for VOC analysis was completed at the twenty-five monitoring well locations shown on Table 1 from April 26 through April 28, 2000. Appendix D presents the analytical data from these monitoring wells and Figure 4 in Appendix A presents the pre-pumping and post-pumping VOC analytical data of the study area.

The summary tables on Figure 4 present VOC data sets representative of pre-pumping conditions and the eight years of post-pumping VOC results, where data are available. The VOC summary figure includes concentrations of tetrachloroethene (PCE), trichloroethene (TCE), total 1,2-dichloroethene (DCE), vinyl chloride (VC), and 1,1,1-trichloroethane (TCA). Figure 4 shows those locations and/or events where cis-1,2-dichloroethene was analyzed instead of total DCE. The mapped VOC data reflect representative pre-pumping VOC results as well as the VOC results from August 1993, 1994, 1995, May 1996, April 1997, May 1997, April 1998, 1999, and 2000, where available.

Most of the changes in analytical results that occurred during the Year 8 monitoring were insignificant relative to historic monitoring. Similar to Year 7, no VOC were detected in the unconsolidated deposit wells UC10S, UC10M, UC10D on the UniFirst property. At the three other unconsolidated deposit locations monitored on the UniFirst property, there was an increase in PCE concentrations at UC6 from 34 µg/L to 43 µg/L, a decrease at UC6S in PCE from 5 µg/L to 2 µg/L, and a decrease at S71S in PCE from 180 µg/L to 89 µg/L.

The bedrock monitoring locations on Figure 4 showed no significant changes in VOC concentrations since the Year 7 monitoring event. VOC concentrations at all points at the UC10 location on the UniFirst property either declined or maintained the same concentration within a small range, as they have done in the past. It appears that shallow bedrock well S70D on the UniFirst property has maintained its steady decline to 3 µg/L, while shallow bedrock well S71D continues to decline from 82 µg/L in 1999 to 49 µg/L.

In summary, the VOC concentration data collected during the Year 8 monitoring generally maintained levels similar to those detected during the Year 7 monitoring. At approximately 85 percent of the wells sampled, no concentration change occurred or remained within the same range of variability that has been measured since the extraction system began operation in 1992. The remaining locations showed minor increases or decreases in concentrations.

4 GROUNDWATER EXTRACTION & TREATMENT SYSTEM PERFORMANCE

The groundwater extraction and treatment system operated for approximately 99.7 percent of the time during the eighth year of operation. Approximately 20.04 million gallons of groundwater were recovered by UC22. Throughout Year 8 the treatment system performed well, with only five unscheduled interruptions in the system operation. PCE and TCE were not present in any discharge samples above their detection limits of 0.5 µg/L. Approximately 105 pounds of PCE and 4.5 pounds of TCE are estimated to have been removed during the eighth year of operation.

The annual system inspection and planned maintenance were performed by HPS and BC Plumbing beginning on September 9, 2000. Inspection forms completed during the annual inspection and planned maintenance are included in Appendix E.

During this past year, twelve monthly Operation and Maintenance summary reports were prepared by HPS and submitted to EPA.

4.1 Influent Water Quality

During the eighth year of operation, six samples of groundwater pumped from the extraction well were collected from S-1, the sample port at the inlet to the treatment system, and analyzed for VOC using EPA Method 8240. The analytical results for these samples are summarized in Appendix F.

Influent concentrations of PCE and TCE, since start-up, are plotted in Figures 1 and 2, respectively. The concentration of PCE ranged from 740 µg/L on January 4, 2000 to 450 µg/L on September 5, 2000. The arithmetic mean of PCE concentrations that were reported over the past year was 626 µg/L.

Influent concentrations of TCE during Year 8 showed a pattern similar to that of PCE, ranging from 38 µg/L to 15 µg/L. The arithmetic mean of TCE concentrations over the past year was 27 µg/L.

A summary of maximum and minimum concentrations of PCE, TCE, and several other relevant VOC are shown in Table 4. Quantification of 1,1-DCE, 1,2-DCE, and 1,1,1-TCA was not possible where these compounds were reported at or below analytical detection limits.

4.2 Discharge Water Quality

Samples of the treated groundwater were collected from the discharge sampling port S-6 monthly. In addition to the twelve S-6 discharge samples collected, duplicate samples were collected on December 7, 1999 and June 6, 2000. These duplicates were given the sample identification S-7. The discharge samples were analyzed for VOC using EPA Method 524.2 and lead using EPA Method 239.2-M. The results of the VOC and lead analyses performed for S-6 and S-7 samples are listed in

Appendix F. A summary of the discharge sampling data for Year 8, along with the discharge limits, is given in Table 5.

Lead concentrations were not detectable throughout the year. PCE and TCE have not been present in the discharge samples above the method detection limits of 0.5 µg/L. Concentrations for 1,1,1 TCA ranged from below the method detection limit to a maximum of 5 µg/L (October 5 and November 2, 1999). A discharge limit for 1,1,1 TCA has not been established; however the clean up levels referenced in the Record of Decision indicate a limit of 200 µg/L.

A discharge sample collected on May 2, 2000 was analyzed for TCL/TAL compounds. The laboratory reports for these analyses are included in Appendix G. According to the report, total barium, total calcium, total iron, total magnesium, total potassium, and total sodium were detected in the sample above the practical limit of quantification (see Table 6). VOC detected in the sample were chloroform (0.7µg/L), 1,1,1-TCA (4µg/L), and 1,1-DCA (0.8µg/L). The remaining compounds were reported below their detection limits.

4.3 Groundwater Pumping Rate & Recovery Well Water Level Elevations

An analysis of the data collected during the May 1991 pumping test yielded a target water-level elevation in the extraction well (UC22) of 15 feet (NGVD) for the long term remedial action. As a result of the pumping test, a pumping rate of approximately 50 gallons per minute (gpm) was targeted to maintain the desired water-level elevation. Long-term operational data indicate that an appropriate water-level elevation and groundwater capture area is achieved at pumping rates less than 50 gpm and water-level elevations above 15 feet. The optimum drawdown elevation of 15 feet above sea level was maintained during the eighth year. Flow rate, carbon pressure, and water level elevation in the pumping well for the eighth year of operation are shown in Figure 3.

Water levels and flow rates remained relatively constant during Year 8, except during system down time. Section 5 describes overall system operations, including system down time. The flow rate for the operational year averaged 38 gpm, which is less than the flow rate projected from the pumping test. Nonetheless, this flow rate was sufficient to maintain the pumping water-level elevation in UC22 below the target elevation for the majority of the operational year.

During the eighth year approximately 20.04 million gallons of groundwater were extracted from UC22.

4.4 Contaminant Mass Removal

The total mass of contaminant removed has been calculated using the average of the influent concentrations of the contaminants and monthly flows. The data used in the mass removal calculations for Year 8 are presented in Appendix I. Approximately 105 pounds of PCE and 4.5 pounds of TCE were removed during the eighth operational year (refer to Table 7 for monthly mass removals). As indicated in Appendix I, 0.70 pounds of 1,1,1-TCA, 0.25 pounds of 1,2-DCE, and

0.17 pounds of 1,1-DCE also were removed from the subsurface by the extraction and treatment system. Approximately 1,535 pounds of PCE and 73 pounds of TCE have been removed during the eight years of operation. The PCE and TCE contaminant mass removed per month for each of the eight years of operation is summarized in Table 7. The cumulative recovery of PCE and TCE over time is shown graphically in Figure 4.

4.5 Ultra-Violet/Chemical Oxidation Unit Performance

The UV/Ox unit is a model SSBC-30R manufactured by Vulcan Peroxidation Systems, Inc. (VPSI). Calgon Carbon Corporation (Calgon) purchased VPSI and assumed the maintenance of the UV/Ox unit for the site. This unit has proven to be a reliable and consistently effective treatment technology providing destruction of the primary contaminants. A summary of laboratory analyses of samples collected from the UV/Ox effluent is presented in Appendix F.

Neither PCE nor TCE were detected in any of twelve sampling events of the UV/Ox effluent, which is followed by carbon treatment before final discharge.

The concentration of 1,1,1-TCA in the UV/Ox effluent was nearly the same as in the influent. These results were predicted during the development of the system design. The UV/Ox unit is not efficient at oxidizing 1,1,1-TCA, and can only do so with substantially increased contact times and chemical oxidant dosages. However, there is no discharge limit for TCA, and the influent concentrations during Year 8 have been below the clean-up target for groundwater of 200 µg/L, as identified in the ROD. Appendix F shows the effluent concentrations of TCA at sample location S-6 to be at or below 5 µg/L during Year 8.

4.6 Carbon Treatment Performance

Downstream of the UV/Ox unit are two carbon adsorption units operating in series. TIGG Corporation supplied the carbon vessels (model C-50Rx). Each vessel contains 1,000 pounds of reactivated granular activated carbon (GAC). The carbon units provide continuous back-up treatment (by contaminant adsorption) for situations when the UV/Ox unit is non-operational or does not provide complete destruction of the contaminants.

Carbon treatment performance is tracked by collecting and analyzing samples between the two carbon vessels from sample port S-5C, and the effluent from the second tank, which is the final discharge, is monitored at sample port S-6. The water quality data for the intermediate carbon point, S-5C, is listed in Appendix F.

Permanent vessels were installed to replace disposable vessels during Year 2. Carbon changes during Year 3 through Year 8 involved replacing only the spent carbon medium versus both the vessel and spent medium. The carbon vessels are fitted with flexible inlet and outlet hoses that allow changing the hydraulic position of the vessels without physically moving them. This facilitates change out by allowing one vessel to remain on line while the other drains and carbon medium is replaced. Refer to Section 5.1 for a discussion of the carbon usage for Year 8.

5 SYSTEM OPERATION AND MAINTENANCE

5.1 Operation Summary

During the eighth year of operation the remedial system had negligible downtime. The reliability of the groundwater extraction and treatment system is demonstrated by the entire system "on-line" time being approximately 99.7 percent of the total elapsed time during the past year. The system was shut down on five occasions in Year 8. The unscheduled events caused the entire system to be "down" and are described in detail below. The dates, duration, and cause of system downtime are summarized in Table 8.

All five of the unscheduled shut downs were attributed to area power failures or "brown-out" conditions.

During servicing of the UV/Ox unit, the extraction system continues to operate with complete treatment provided by the carbon tanks. In addition, during carbon changes, one unit is left "on-line," to provide treatment of the groundwater before discharging while the other unit is rebedded with fresh carbon.

Ultraviolet/Chemical Oxidation Unit

The UV/Ox unit was operational approximately 8,733 hours during the eighth year of operation, or about 99.7 percent of the time. The UV/Ox unit downtime was coincident with the unscheduled system downtime described above. Calgon's service technician, as part of its service agreement, performed routine maintenance on the unit. This included replenishing the hydrogen peroxide supply, replacing the UV/Ox lamp enclosure seals, and calibrating the H_2O_2 pumps. Some of the non-routine maintenance included replacing the UV/Ox lamps and quartz tubes.

The UV/Ox unit operates on three of the six available lamps and continues to provide efficient destruction of the primary contaminants of concern (PCE and TCE). The current average instantaneous power demand by the unit is approximately 15,000 watts.

Calgon supplies hydrogen peroxide (H_2O_2), the oxidant utilized by the UV/Ox unit, in a 50 percent solution. Approximately 650 gallons or 6,500 pounds of the H_2O_2 solution was used during the past year of operations, as reported by Calgon. Based on the total annual flow, an average of approximately 0.32 lbs. of the H_2O_2 solution was used per 1,000 gallons of groundwater treated or an average dosage of about 19.2 mg/L of H_2O_2. The residual H_2O_2 concentration in the UV/Ox unit effluent generally ranged from 6 to 10 µg/L as determined by field colorimetric methods (see Appendix H). The downstream carbon vessels remove residual H_2O_2.

Carbon Tanks

The carbon vessels provided back-up treatment and polishing of the system discharge during the eighth year of operation with minimal maintenance requirements.

The primary carbon vessel was taken off-line to allow change-out of the spent granular activated carbon (GAC) on November 2, 1999. During this time, the secondary unit remained in service to provide back-up treatment. The spent GAC was removed from the vessel and replaced with fresh GAC. The carbon vessel was filled with water and brought on-line in the secondary position on November 8, 1999. Service Tech, Inc. supplied and installed the fresh virgin carbon medium and removed and managed the spent carbon.

After the carbon change, the carbon vessel was backwashed to remove "carbon fines" that are typically present in a carbon bed. After the carbon change, the carbon pressure has remained relatively stable throughout the remainder of the operation year.

Based on the flow rates and amount of spent carbon, the total carbon usage rates were approximately 67 pounds/million gallons (MG) from February 4, 1999 to November 2, 1999. These usage rates were calculated using the following equation:

Carbon Usage Rate = (Carbon Mass) / (Volume of Water Pumped for Time Period [MG])

5.2 Maintenance Summary

The treatment system maintenance activities performed during the eighth year of operation fall into two general categories, routine and non-routine, both of which are briefly discussed below.

Routine Maintenance and System Monitoring

Fifty-two routine system inspections were conducted during the past year on a weekly basis. During each inspection an operation log was completed by HPS or AO, Inc., and filed on-site. In addition to the on-site inspections, HPS or AO reviewed operational parameters and downloaded the data via a modem link to the data logger on an average frequency of once per week.

Routine maintenance tasks are generally scheduled to coincide with the system inspections. Routine maintenance consists of injecting the previously settled backwash water back into the treatment system and backwashing the multi-media filter and carbon units, if needed. The dates that the multimedia filter and the primary and secondary carbon were backwashed are shown on Table 9.

The Calgon service technician performed routine inspections and maintenance of the UV/Ox unit as part of Calgon's lease agreement. On November 8, 1999 and June 13, 2000, Calgon delivered hydrogen peroxide to the site.

Non-Routine Maintenance

Non-routine maintenance performed involved one carbon change. The carbon in the primary vessel was replaced with virgin carbon on November 5, 1999.

During the annual maintenance, BC Plumbing determined that the pressure-reducing valve needed to be replaced. This valve was replaced on October 11, 2000.

5.3 Quarterly Sensor Check

There are three sensors incorporated into the treatment system, one flow sensor and two pressure transducers. The accuracy of these sensors was evaluated on October 12, 1999, December 29, 1999, April 4, 2000 and July 5, 2000. When the checks indicated that the acceptable margins of error had been exceeded, adjustments were made to correlate the sensor outputs with the manual readings. Quarterly sensor calibration checklists were completed to provide documentation of the sensor checks. Copies of these checklists are filed on-site.

5.4 Annual Inspection & Maintenance

On September 9, 2000, HPS performed the annual inspection of the treatment system. The completed checklist is included in Appendix E. All components passed inspection. One valve (B-16) was determined to need replacement.

On September 20, 2000, BC Plumbing replaced components in the diaphragm check valve and determined that the pressure-reducing valve needed to be replaced. The completed maintenance checklist, prepared by B.C. Plumbing, is included in Appendix E.

5.5 System Modifications

No system modifications were made.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Monitoring System

The water-level elevation data collected during the Year 8 annual monitoring showed similar elevations and area of groundwater capture relative to the elevations collected during Year 7.

The VOC concentrations detected during the Year 8 sampling event showed equilibrated conditions at a majority of the monitoring well locations. Locations where minor increases and decreases in VOC concentrations were detected, relative to previous monitoring results, will be monitored to determine if these trends continue.

The water-level elevation data and VOC concentrations continue to demonstrate that the groundwater capture area is larger than the intended area as described in Section 2.0 of this report.

UniFirst will consider reductions in the scope of the monitoring system based on the continued equilibrium conditions observed in the data.

6.2 Treatment System

The system has provided complete treatment of over 20 million gallons of groundwater, during the eighth year of operation, and a cumulative total of 174.5 million gallons during eight years of operation.

Due to the success of this system in achieving the extraction and treatment goals, no significant operation or system adjustments are required at this time.

The system's capital and equipment replacement costs are relatively small when compared to the long-term operational cost. Therefore, continuing engineering reviews will be performed to evaluate possible methods to optimize the system's operational efficiency for reducing operation and/or maintenance costs without compromising its effectiveness.

UniFirst performed a non-quantitative economic analysis of groundwater treatment costs during the five-year review of the system. Based on the results of that analysis UniFirst recommended that the existing UV/Ox with GAC back-up system be replaced with a treatment system that more cost-effectively addresses the measured, stable influent concentrations. In June 2000, UniFirst submitted a preliminary proposal to EPA to replace the UV/Ox unit with additional carbon tanks and is currently working on a more detailed design change proposal for submittal later in 2000.

TABLE 1
Monitoring Wells Sampled for VOC

GO1DB	UC6	UC10-2
S70D	UC6S	UC10-3
S71S	UC7-1	UC10-4
S71D	UC7-2	UC10-5
S81S	UC7-3	UC10-6
S81M	UC7-4	UC10S
S81D	UC7-5	UC10M
UG1-4	UC10-1	UC10D
		UC11-2

TABLE 2
Monitoring Wells in the Water Level Monitoring Network

DP1S	S65M	UC9-2	UC22*
DP1D	S65DR	UC9-4	UC23-1
DP2S	S66D	UC9-6	UC23-2
DP2M	S67S	UC10S	UC23-3
DP2D	S67M	UC10M	UC23-4
DP3	S67D	UC10D	UC23-5
DP36	S69D	UC10-1	UC24S
DP37S	S70S	UC10-2	UC24D
DP37D	S70M	UC10-3	UC25
K42S	S70D	UC10-4	UC26S
K42M	S71S	UC10-5	UC26D
K42D	S71D	UC10-6	UC29S
GO1S	S81S	UC11-2	UC29D
GO1D	S81M	UC11-6	UC30
GO1DB	S81D	UC12-1	UC31S
IUS1	S82	UC12-2	UC31M
IUS2A	S97S	UC12-3	UC31D
IUS2B	S97M	UC12-4	UG1-1
IUS2C	S97D	UC12-5	UG1-2
IUS3A	UC4	UC12-6	UG1-3
IUS3B	UC5	UC15S	UG1-4
IUS3C	UC6S*	UC15D	UG1-5
S7R	UC6*	UC16	UG1-6
S63S	UC7A-1	UC17	UG1-7
S63D	UC7A-2	UC18	UC32
S64S	UC7A-3	UC19S	UC33
S64M	UC7A-4	UC19D	UC34
S64D	UC7A-5	UC19	UC35
S65S	UC8	UC20	UC36

* Wells monitored both manually and with data loggers set to record every 60 minutes, except for UC22, which records every 15 minutes.

TABLE 3

Location of Monitoring Well Screened Intervals

WELL DATA				WELL DATA				WELL DATA			
WELL NO.	GEO. UNIT	TOS EL FT	BOS EL FT	WELL NO.	GEO. UNIT	TOS EL FT	BOS EL FT	WELL NO.	GEO. UNIT	TOS EL FT	BOS EL FT
DP1S	DR	45.50	44.40	S70S	SR	54.00	39.00	UC15S	DPB	-10.00	-20.00
DP1D	DR	45.40	34.40	S70M	DR	27.00	7.00	UC15D	DPB	-202.00	-212.00
				S70D	SHB	2.00	-13.00				
DP2S	DR	44.47	43.47					UC16	SHB	62.00	44.00
DP2M	DR	30.12	29.12	S71S	DR	60.00	55.00				
DP2D	DR	14.80	13.80	S71D	SHB	49.00	29.00	UC17	SHB	62.00	44.00
DP3	DR	45.22	44.22	S81S	DR	44.00	34.00	UC18	SHB	60.00	40.00
				S81M	DR	20.00	5.00				
DP25	DR	48.91	47.91	S81D	SHB	-13.00	-28.00	UC19S	DR	64.40	54.40
								UC19M	DR	43.30	38.30
DP36	DR	51.02	50.02	S82	DR	32.00	22.00	UC19	SHB	31.00	12.00
DP37S	DR	45.82	44.82	S97S	DR	40.00	35.00	UC20	SHB	65.00	46.00
DP37D	DR	42.75	41.75	S97M	DR	26.00	24.00				
				S97D	SHB	12.00	5.00	UC22	SHB	70.00	-105.00
DP38	DR	70.74	69.74								
				UC4	SHB	64.00	54.00	UC23-5	DPB	-141.00	-152.00
GO1S	DR	65.00	55.00					UC23-4	DPB	-164.00	-174.00
GO1D	SHB	49.00	34.00	UC5	DR/SHB	64.00	54.00	UC23-3	DPB	-197.00	-213.00
GO1DB	DPB	18.00	3.00					UC23-2	DPB	-283.00	-293.00
				UC6S	DR	59.50	49.50	UC23-1	DPB	-303.00	-308.00
IUS1	SHB	76.00	61.00	UC6	DR	35.00	25.00				
								UC24S	DR	60.90	50.90
IUS2C	DR	51.00	41.00	UC7A-5	DR	71.00	53.00	UC24D	DR	22.80	17.80
IUS2B	DR	21.00	6.00	UC7A-4	SHB	50.00	9.00				
IUS2A	SHB	-10.00	-28.00	UC7A-3	DPB	6.00	-18.00	UC25	DR	66.40	56.40
				UC7A-2	DPB	-21.00	-46.00				
IUS3C	DR	62.00	42.00	UC7A-1	DPB	-60.00	-77.00	UC26S	DR	60.19	53.39
IUS3B	DR	37.00	22.00					UC26D	DR	39.31	34.31
IUS3A	DR/SHB	20.00	4.00	UC8	DR/SHB	69.00	54.00				
								UC29S	DR	60.82	54.02
K42S	DR	35.90	34.90	UC9-6	SHB	67.00	47.00	UC29D	DR	50.91	45.91
K42M	DR	11.30	10.30	UC9-4	DPB	-18.00	-28.00				
K42D	DR	-9.2	-10.2	UC9-2	DPB	-86.00	-97.00	UC30	DR	64.78	58.98
S6	DR/SHB	54.00	-36.00	UC10S	DR	59.60	49.60	UC31S	DR	58.36	52.26
				UC10M	DR	38.80	33.80	UC31M	DR	40.41	35.41
S7	DR/SHB	90.80	66.80	UC10D	DR	20.10	23.10	UC31D	DR	22.52	17.52
S63S	DR	58.00	48.00	UC10-6	DPB	-8.00	-23.00	UC32	DR	67.47	66.82
S63D	SHB	44.00	34.00	UC10-5	DPB	-55.00	-59.00				
				UC10-4	DPB	-78.00	-88.00	UC33	DR	62.89	66.24
S64S	DR	48.00	43.00	UC10-3	DPB	-102.00	-112.00				
S64M	DR	31.00	26.00	UC10-2	DPB	-145.00	-157.00	UC34	DR	68.91	68.26
S64D	SHB	18.00	3.00	UC10-1	DPB	-161.00	-173.00				
								UC35	DR	66.59	65.94
S65S	DR	31.00	21.00	UC11-6	DPB	29.00	19.00				
S65M	DR	50.00	40.00	UC11-4	DPB	-95.00	-103.00	UC36	DR	68.11	67.46
S65DR	SHB	73.00	53.00	UC11-2	DPB	-183.00	-203.00				
				UC11-1	DPB	-250.00	-265.00	UG1-7	DPB	-38.00	-48.00
S66D	SHB	50.00	35.00					UG1-6	DPB	-75.00	-86.00
				UC12-6	DPB	24.00	16.00	UG1-5	DPB	-91.00	-99.00
S67S	DR	59.00	49.00	UC12-5	DPB	-3.00	-20.00	UG1-4	DPB	-143.00	-154.00
S67M	DR	50.00	40.00	UC12-4	DPB	-72.00	-87.00	UG1-3	DPB	-301.00	-317.00
S67D	SHB	23.00	8.00	UC12-3	DPB	-126.82	-127.32	UG1-2	DPB	-397.00	-408.00
				UC12-2	DPB	-203.06	-203.56	UG1-1	DPB	-413.00	-416.00
S69	SHB	35.00	20.00	UC12-1	DPB	-238.00	-268.00				

Key: DR = glacial drift SHB = shallow bedrock DPB = deep bedrock TOS = top of screen BOS = bottom of screen

Note: All well screen depths are elevations in feet above national geodetic vertical datum.

TABLE 4
Year 8 Influent VOC Concentration Summary

Parameter	Minimum	Maximum
Tetrachloroethene (PCE)	450 µg/L	740 µg/L
Trichloroethene (TCE)	15 µg/L	38 µg/L
1,1 Dichloroethene (1,1 DCE)	<5 µg/L	<5 µg/L
1,2 Dichloroethene (1,2 DCE)	4 µg/L	<10 µg/L
1,1,1-Trichloroethane (1,1,1 TCA)	3 J µg/L	5 µg/L

Values in parentheses are the detection limits.
J is an estimated concentration.

TABLE 5
Year 8 Discharge Concentration Summary

Parameter	Discharge Limit[1] (µg/L)	Minimum (µg/L)	Maximum (µg/L)
1,1 Dichloroethene (1,1-DCE)	7	<0.5 (0.5)	0.9
1,2 Dichloroethene (1,2-DCE)	70	<0.5 (0.5)	<0.5 (0.5)
1,1,1-Trichloroethane (1,1,1-TCA)	No Limit	<0.6	5
Tetrachloroethene (PCE)	5	<0.3 J (0.5)	<0.4 J (0.5)
Carbon Tetrachloride	5	<0.5 (0.5)	<0.5 (0.5)
Benzene	5	<0.5 (0.5)	<0.5 (0.5)
Trichloroethene (TCE)	5	<0.3 J (0.5)	<0.4 J (0.5)
Lead	10.2	<0.68	<1.3

Detection limits for VOC are presented in parentheses.

[1] The discharge limits are for average monthly concentrations.

J (VOC) or B (Lead) indicates an estimated value, the result was below the detection limit

TABLE 6
Year 7 TCL/TAL Analytical Results for S-6

Parameter	Result (µg/L)
Barium	21.4
Calcium	121,000
Iron	20.5
Magnesium	14,600
Potassium	2,570
Sodium	107,000
Cyanide, total	<10
Chloroform	0.7
1,1,1-TCA	4.0
1,1-Dichlorethane	0.8

TABLE 7
Chemical Mass Removal Rates

PCE (lbs.)

Month	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000
Oct	15.4	28.8	15.0	14.3	9.1	10.4	8.4	7.7
Nov	23.4	28.1	20.2	15.6	17.4	9.4	9.6	8.6
Dec	25.3	26.1	11.6	17.3	12.3	11.9	8.1	9.5
Jan	31.9	34.7	16.6	17.8	11.5	10.0	6.7	10.1
Feb	24.3	12.0	23.4	13.5	11.7	10.0	12.7	9.2
Mar	34.0	30.0	37.8	10.5	11.1	8.8	20.4	10.4
Apr	24.7	30.8	24.8	14.7	12.9	14.0	16.3	9.6
May	33.9	27.8	16.9	18.9	11.6	12.2	11.8	9.4
Jun	37.3	22.4	15.6	14.7	10.5	9.9	7.1	8.7
Jul	34.4	23.1	15.7	11.4	12.4	12.1	9.5	8.3
Aug	25.7	21.2	14.4	11.4	10.5	9.2	10.5	7.3
Sep	21.5	19.3	12.5	11.0	11.5	7.0	10.5	6.1
Total	331.8	304.3	224.5	171.1	142.5	124.7	131.7	104.9

TCE(lbs.)

Month	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000
Oct	1.00	1.50	1.10	0.80	0.40	0.55	0.41	0.45
Nov	1.90	1.40	1.20	0.80	0.50	0.50	0.41	0.50
Dec	1.90	1.40	1.10	0.90	0.90	0.49	0.42	0.51
Jan	2.10	1.40	0.70	1.00	0.50	0.41	0.43	0.49
Feb	1.60	0.40	0.70	0.80	0.50	0.41	0.61	0.40
Mar	1.80	0.80	0.80	0.60	0.50	0.23	0.88	0.38
Apr	1.60	0.90	0.80	0.60	0.50	0.48	0.70	0.29
May	1.50	1.20	0.90	0.60	0.40	0.51	0.50	0.22
Jun	1.60	0.90	0.80	0.60	0.40	0.43	0.40	0.31
Jul	1.70	1.00	0.80	0.80	0.60	0.37	0.44	0.41
Aug	1.40	1.00	0.80	0.70	0.50	0.44	0.47	0.34
Sep	1.20	1.00	0.80	0.70	0.60	0.40	0.46	0.27
Total	19.3	12.9	10.5	8.9	6.3	5.2	6.1	4.6

Total (lbs)

Month	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000
Oct	16.4	30.3	16.1	15.1	9.5	10.9	8.84	8.14
Nov	25.3	29.5	21.4	16.4	17.9	9.9	10.04	9.06
Dec	27.2	27.5	12.7	18.2	13.2	12.4	8.52	10.01
Jan	34.0	36.1	17.3	18.8	12.0	10.4	7.17	10.61
Feb	25.9	12.4	24.1	14.3	12.2	10.4	13.29	9.64
Mar	35.8	30.8	38.6	11.1	11.6	9.0	21.30	10.74
Apr	26.3	31.7	25.6	15.3	13.4	14.4	17.02	9.91
May	35.4	29.0	17.8	19.5	12.0	12.7	12.30	9.61
Jun	38.9	23.3	16.4	15.3	10.9	10.4	7.46	8.98
Jul	36.1	24.1	16.5	12.2	13.0	12.5	9.93	8.72
Aug	27.1	22.2	15.2	12.1	11.0	9.6	10.93	7.61
Sep	22.7	20.3	13.3	11.7	12.1	7.4	10.99	6.40
Total	351.1	317.2	235.0	180.0	148.8	129.9	137.79	109.43

TABLE 8
Year 8 Downtime Summary

Date	Unscheduled (Hours)	Reason/Cause
01/25/00	2	Power Outage
02/29/00	3	Power Outage
03/28/00	7	Power Outage
05/03/00	8	Power Outage
08/16/00	7	Power Outage
Total	27.0	

Percentage Downtime (8,760-27)/8,760 = 99.7%

TABLE 9
Backwash Events Year 8

Carbon Tanks		MultiMedia
Primary	Secondary	Sand Filter
05-Oct-99	26-Oct-99	23-Nov-99
11-Nov-99	21-Dec-99	11-Apr-00
15-Dec-99	18-Jan-00	29-Aug-00
05-Jan-00	22-Feb-00	
15-Feb-00	18-Jul-00	
18-Apr-00		
25-Jul-00		

Figure 1 - Influent Tetrachloroethene Concentration

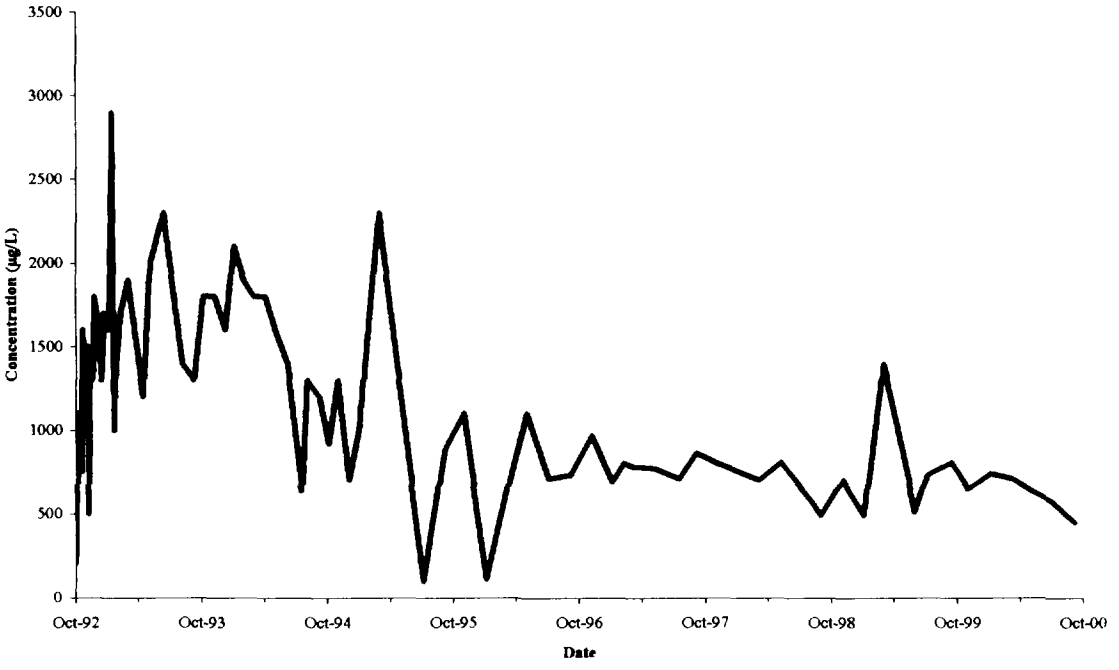
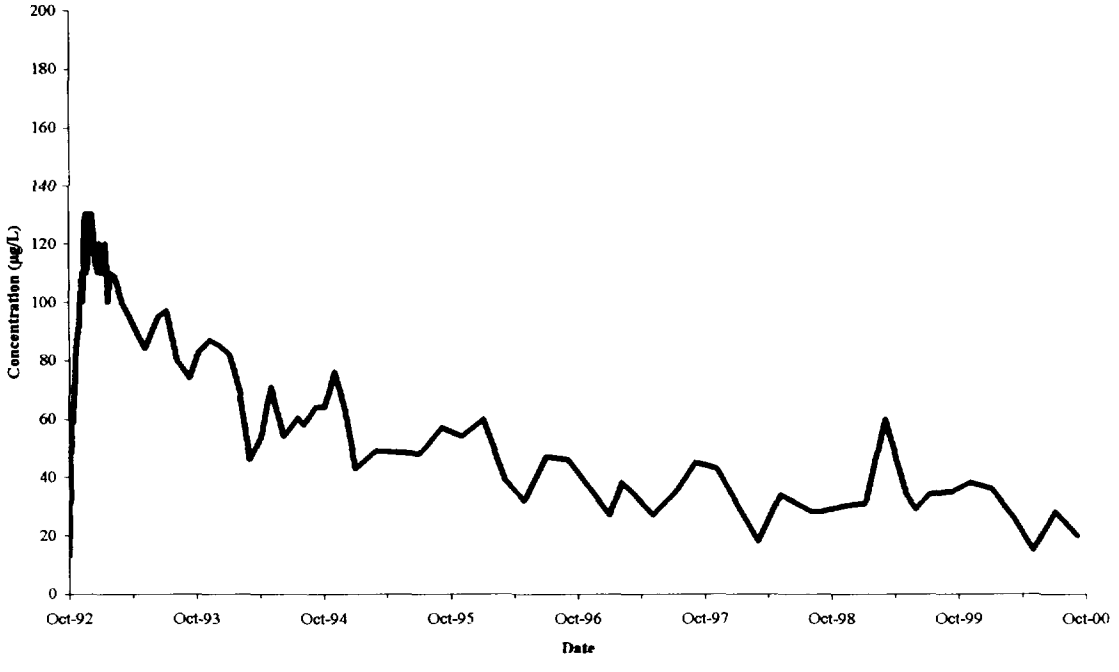


Figure 2 - Influent Trichloroethene Concentration



Original includes color coding.

UniFirst Ground Water Treatment Plant, Woburn, Year 8 Operations

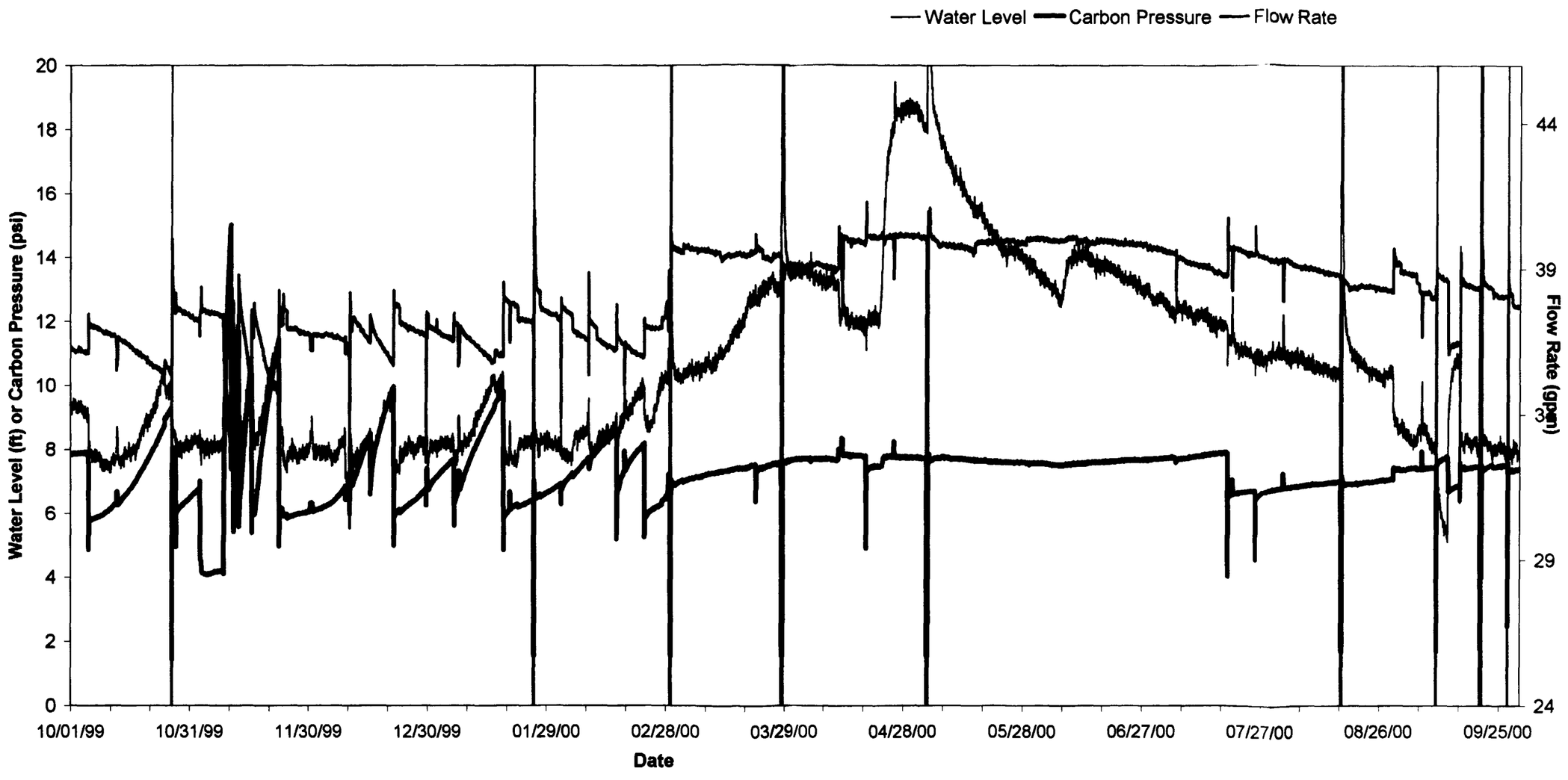
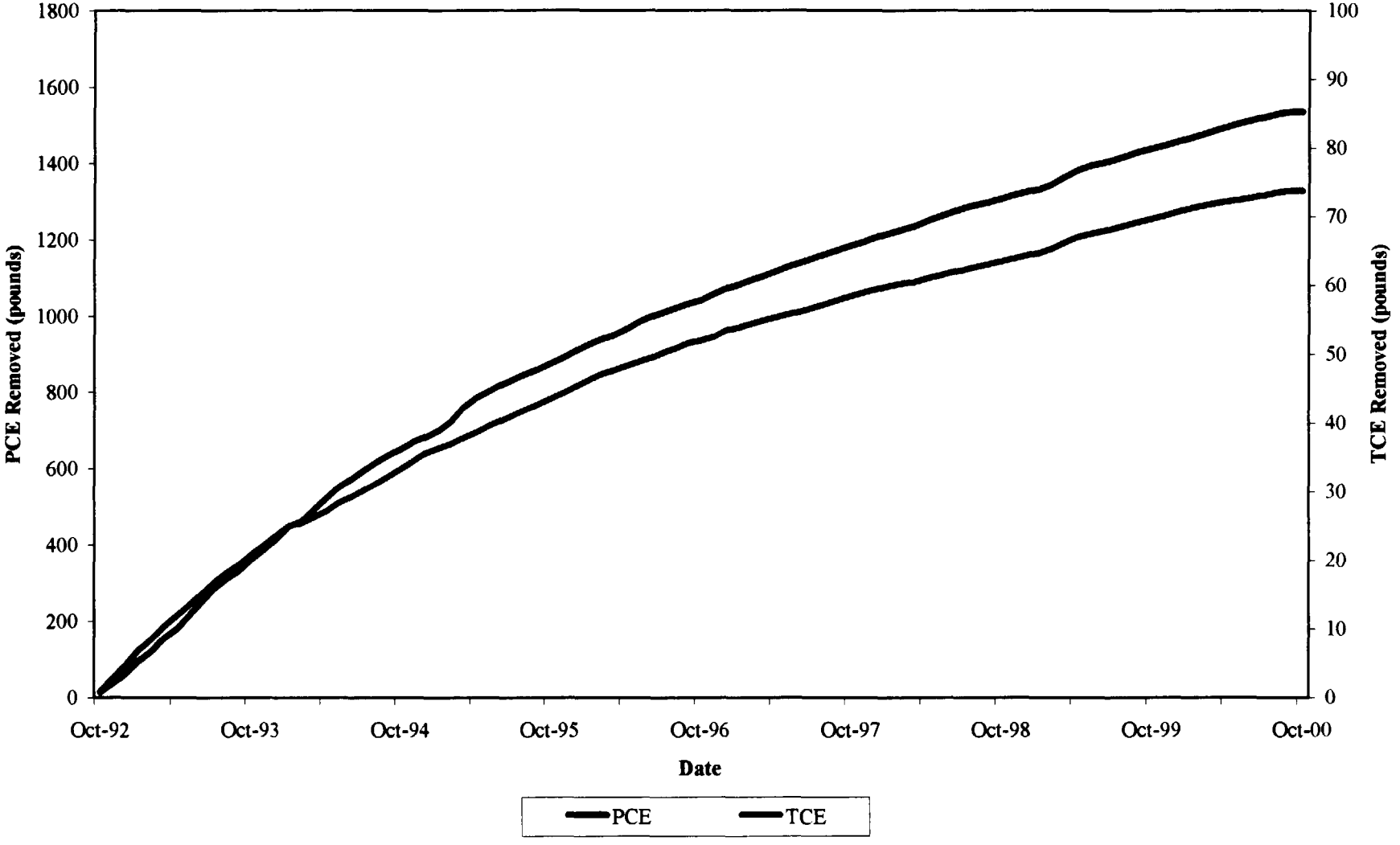


Figure 4 - Cumulative Chemical Recovery



Original includes color coding.

Appendix A

Potentiometric Maps
& Cross-Sections

SOUTH
SOUTHWEST
C

NORTH
NORTHEAST
C'

INTERSECTION L-L'
DEWEY AVE.
MARIETTA ST.
OLYMPIA AVE.
PROJECTED INTO BEDROCK
UNIFIRST BLDG.
ROUTE 128 RAMP
INTERSECTION D-D'
BLISS MARINE
ROUTE 128

S97S/M/D
S64S/M/D
UC11
S63S/D
S71S/D
UC7A
UC25
UC4
UC16
UC5
UC8
UC29
UC17
UC22
UC9
UC23
US1

UNCONSOLIDATED DEPOSITS
BEDROCK

46.88
45.88
46.0
54.5
54.81
54.56
57.82
57.69
NM
NM
NM
NM
NM
NM
NM
NM
NM
NM
65.83
61.14
60.69
52.55
60.96
62.34
70.06
51.96
67.81
41.77
32.98
33.03
18.16
76.96
37.27
35.33
53.41
30.52
28.80

60
50
20
30

ELEVATION IN FEET ABOVE NATIONAL GEODETIC VERTICAL DATUM

100 90 80 70 60 50 40 30 20 10 0 −10 −20 −30 −40 −50 −60 −70 −80 −90 −100 −110 −120 −130 −140 −150 −160 −170 −180 −190 −200 −210 −220 −230 −240 −250 −260 −270 −280 −290 −300 −310

50
VERTICAL EXAGGERATION 5:1
0 250
SCALE IN FEET

3140B30B

EXPLANATION

74.52 — MONITORING WELL SCREEN, VALUE INDICATES WATER LEVEL ELEVATION MEASURED APRIL, 2000

OPEN INTERVAL BETWEEN PACKERS IN MULTI LEVEL INSTALLATIONS AND PORT LOCATION

— 60 — EQUAL POTENTIAL CONTOUR (DASHED WHERE INFERRED)

GEOLOGIC CONTACT (DASHED WHERE INFERRED)

POTENTIOMETRIC SURFACE (DASHED WHERE INFERRED)

NM — NOT MEASURED DUE TO UNFAVORABLE FIELD CONDITIONS OR A MALFUNCTIONING PORT

* — ANOMALOUS VALUE NOT CONSIDERED IN CONTOURS

NOTES: 1. THE POTENTIOMETRIC SURFACE IS BASED ON THE CONTOURED WATER LEVEL MEASUREMENT FROM THE SHALLOWEST WELLS.

2: THE EXTENT OF THE UC22 DRAWDOWN CONE IS ESTIMATED TO BE LOCAL.

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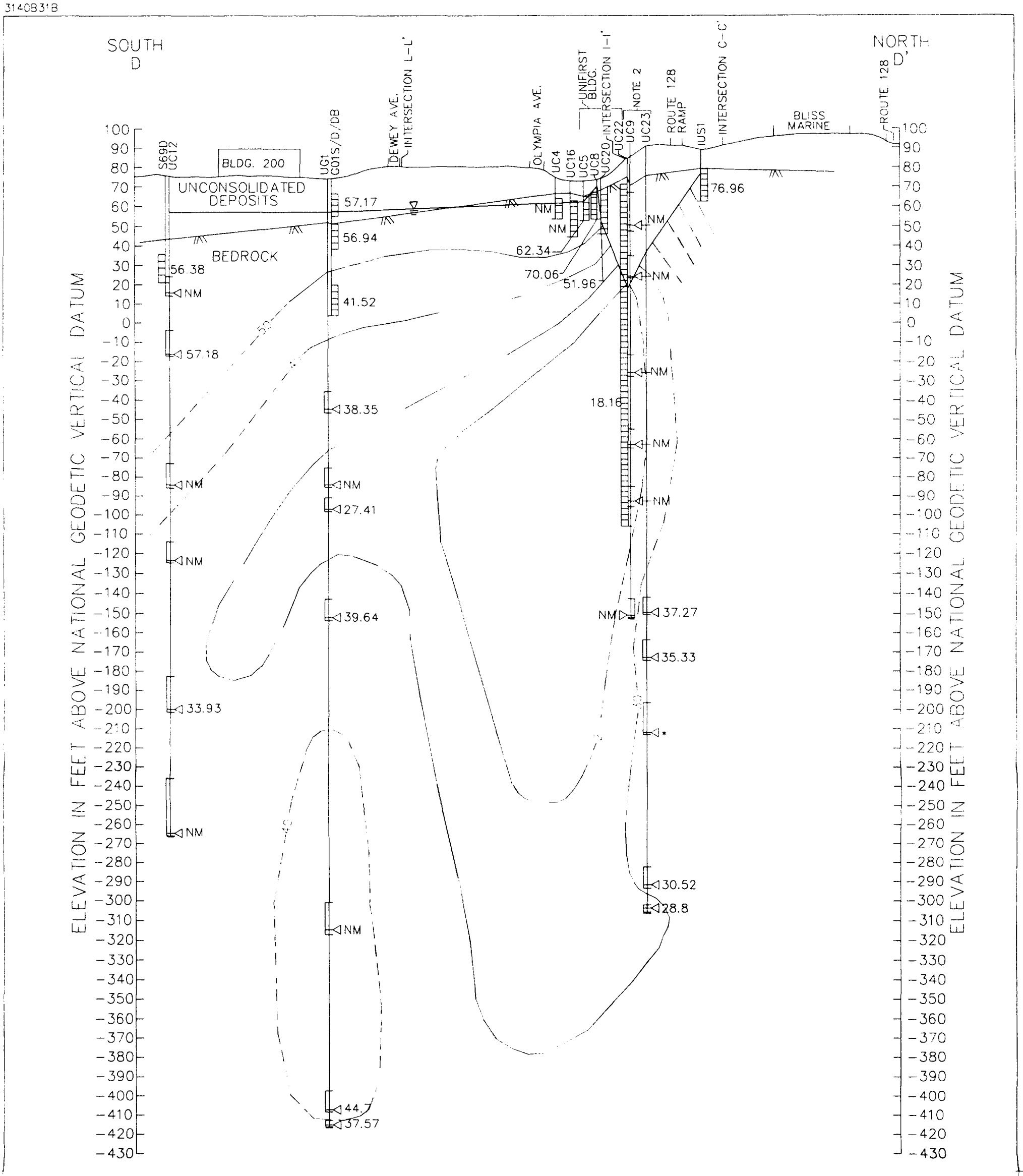
FIGURE 1A

POTENTIOMETRIC CROSS-SECTION C-C'
MEASURED IN APRIL, 2000

3140B31B



EXPLANATION

71.85 — MONITORING WELL SCREEN, VALUE INDICATES WATER LEVEL ELEVATION MEASURED APRIL, 2000

OPEN INTERVAL BETWEEN PACKERS IN MULTI LEVEL INSTALLATIONS AND PORT LOCATION

60 — EQUAL POTENTIAL CONTOUR (DASHED WHERE INFERRED)

GEOLOGIC CONTACT (DASHED WHERE INFERRED)

POTENTIOMETRIC SURFACE (DASHED WHERE INFERRED)

NM — NOT MEASURED DUE TO UNFAVORABLE FIELD CONDITIONS OR A MALFUNCTIONING PORT

* — ANOMALOUS VALUE NOT CONSIDERED IN CONTOURS

50 — VERTICAL EXAGGERATION 5:1

0 250 — SCALE IN FEET

NOTES:
1. THE POTENTIOMETRIC SURFACE IS BASED ON THE CONTOURED WATER LEVEL MEASUREMENT FROM THE SHALLOWEST WELLS.
2. THE POSITION OF WELL UC23 IS ADJUSTED TO THE NORTH < 50' TO GRAPHICALLY ILLUSTRATE THIS WELL DUE TO OVERLAP OF UC9 AND UC23 ON ALIGNMENT D-D'.
3. THE EXTENT OF THE UC22 DRAWDOWN CONE IS ESTIMATED TO BE LOCAL.

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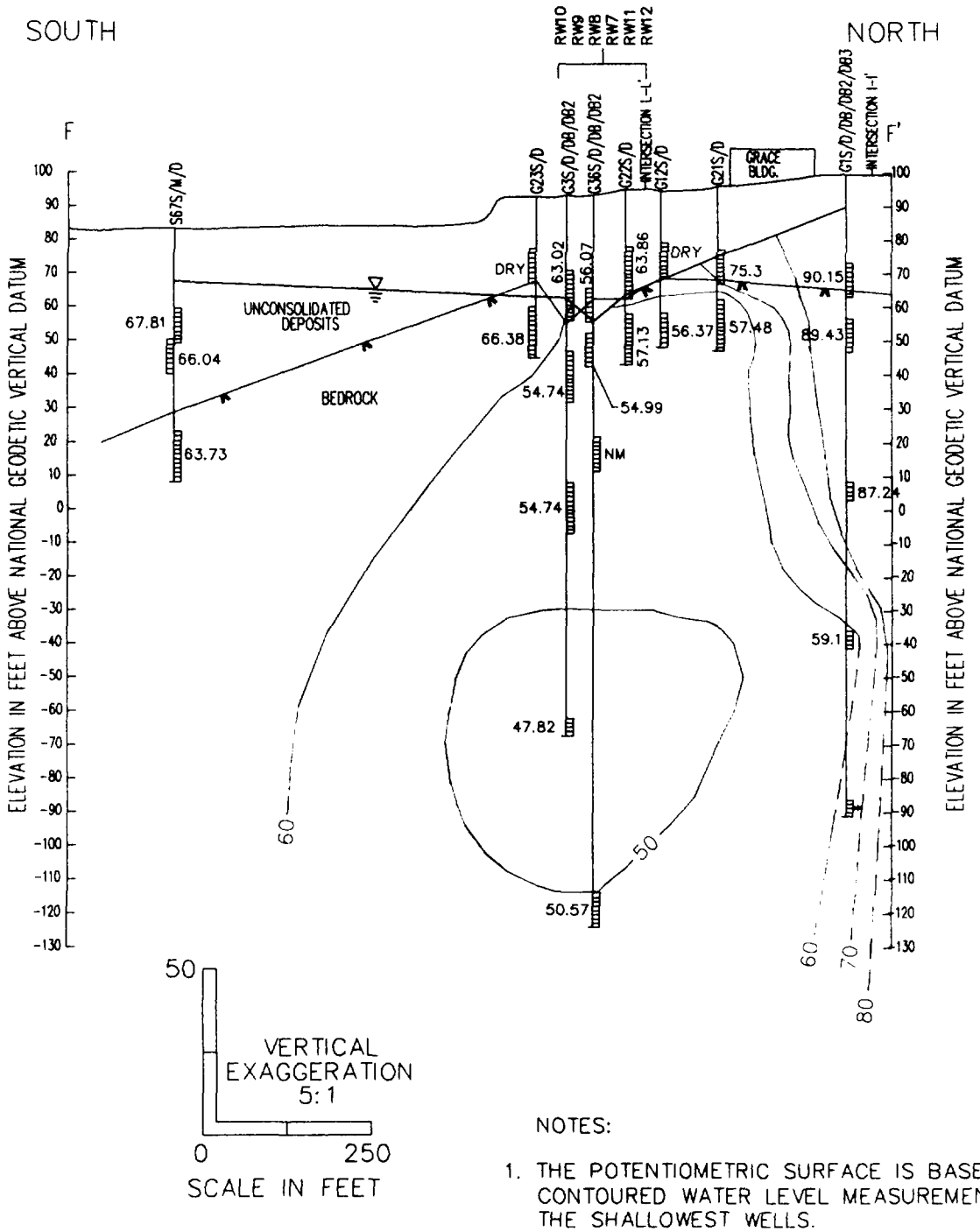
FIGURE 1B

POTENTIOMETRIC CROSS-SECTION D-D'
MEASURED IN APRIL, 2000

3140834B



NOTES:

1. THE POTENTIOMETRIC SURFACE IS BASED ON THE CONTOURED WATER LEVEL MEASUREMENT FROM THE SHALLOWEST WELLS.
2. GRACE RECOVERY WELL WATER LEVELS PROJECTED TO SECTION.

EXPLANATION

74.52 — MONITORING WELL SCREEN, VALUE INDICATES WATER LEVEL ELEVATION MEASURED APRIL, 2000

EQUAL POTENTIAL CONTOUR (DASHED WHERE INFERRED)

GEOLOGIC CONTACT (DASHED WHERE INFERRED)

POTENTIOMETRIC SURFACE (DASHED WHERE INFERRED)

* ANOMALOUS VALUE NOT CONSIDERED IN CONTOURS

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FIGURE 1C

POTENTIOMETRIC CROSS-SECTION F-F'
MEASURED IN APRIL, 2000

WEST
I

EAST
I'

ELEVATION IN FEET ABOVE NATIONAL GEODETIC VERTICAL DATUM

UC14 | FENCE UC10 UC10S/M/D | UC19M UC19 UC19S | UC18 | UC17 INTERSECTION C-C' | UC22 UC9 INTERSECTION D-D' | UC23 | WASHINGTON ST. | INTERSECTION F-F' G1DB,DB2,DB3 G1S/D | G20S/M/D G29S | G8S | INTERSECTION L-L' G2S/M/D/DB/DB2 | STREAM

UNCONSOLIDATED DEPOSITS

BEDROCK

61.47 | 59.60 | 61.51 | 59.35 | 58.49 | 67.81 | 52.40 | 55.32 | NM | 18.16 | 50.75 | 41.84 | 39.54 | NM | 37.27 | 35.33 | * | 30.52 | 28.80 | 90.15 | 89.43 | NM | 92.96 | 89.35 | 89.02 | 96.63 | 87.24 | 59.1 | * | 93.22 | 93.25 | 92.78 | 92.82 | 92.71

60 | 50 | 20 | 30 | 40 | 60 | 70 | 80 | 90

EXPLANATION

- 66.46 — MONITORING WELL SCREEN, VALUE INDICATES WATER LEVEL ELEVATION MEASURED APRIL, 2000
- OPEN INTERVAL BETWEEN PACKERS IN MULTI LEVEL INSTALLATIONS AND PORT LOCATION
- 60 — EQUAL POTENTIAL CONTOUR (DASHED WHERE INFERRED)
- GEOLOGIC CONTACT (DASHED WHERE INFERRED)
- POTENTIOMETRIC SURFACE (DASHED WHERE INFERRED)
- NM — NOT MEASURED DUE TO UNFAVORABLE FIELD CONDITIONS OR A MALFUNCTIONING PORT,
- * — ANOMALOUS VALUE NOT CONSIDERED IN CONTOURS

50
VERTICAL EXAGGERATION 5:1
0 250
SCALE IN FEET

NOTES:
1. THE POTENTIOMETRIC SURFACE IS BASED ON THE CONTOURED WATER LEVEL MEASUREMENT FROM THE SHALLOWEST WELLS.
2. THE EXTENT OF THE UC22 DRAWDOWN CONE IS ESTIMATED TO BE LOCAL.

3140B33B

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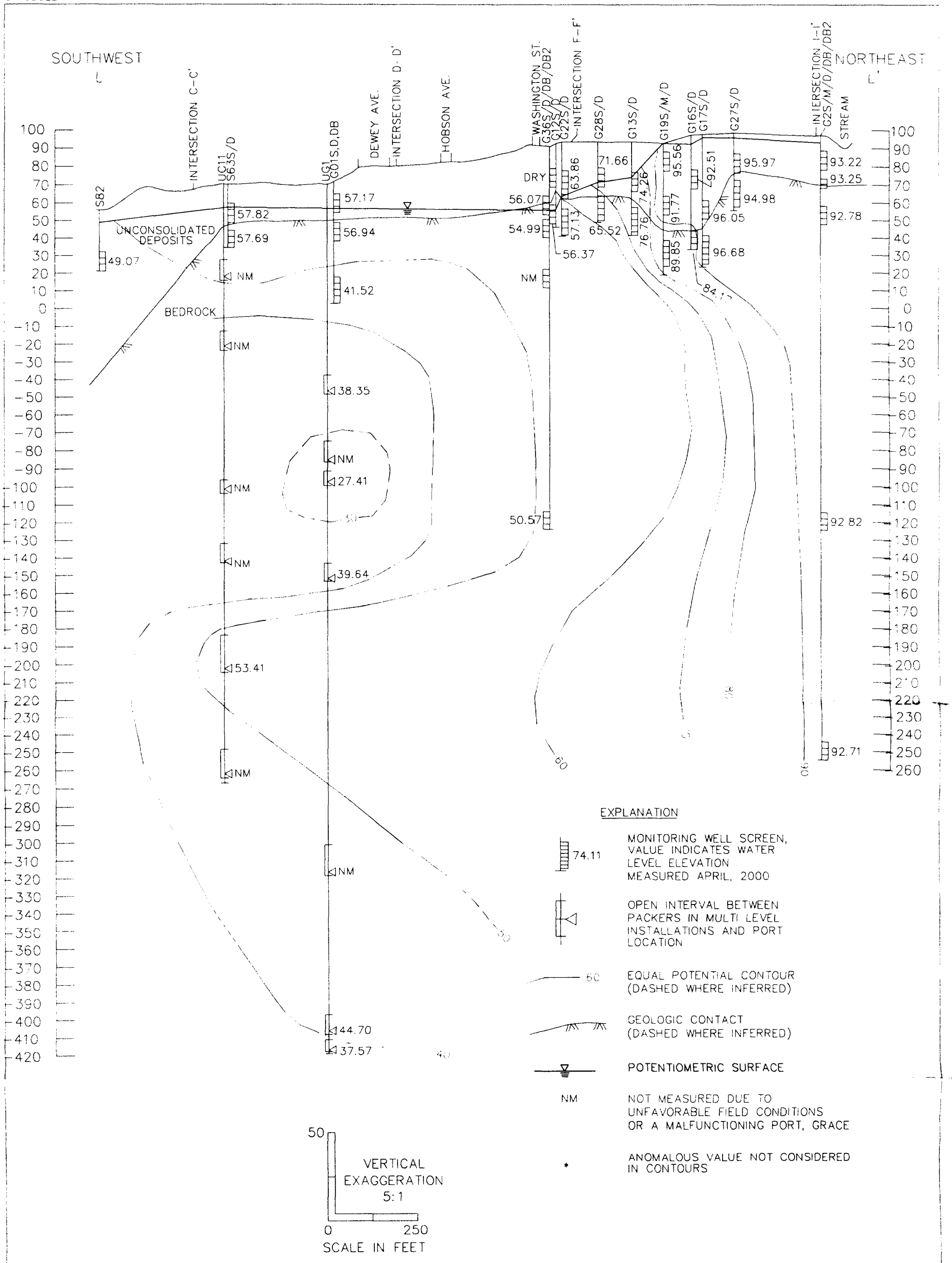
FIGURE 1D

POTENTIOMETRIC CROSS-SECTION I-I'
MEASURED IN APRIL, 2000

3140B32B



EXPLANATION

74.11	MONITORING WELL SCREEN, VALUE INDICATES WATER LEVEL ELEVATION MEASURED APRIL, 2000
	OPEN INTERVAL BETWEEN PACKERS IN MULTI LEVEL INSTALLATIONS AND PORT LOCATION
60	EQUAL POTENTIAL CONTOUR (DASHED WHERE INFERRED)
	GEOLOGIC CONTACT (DASHED WHERE INFERRED)
	POTENTIOMETRIC SURFACE
NM	NOT MEASURED DUE TO UNFAVORABLE FIELD CONDITIONS OR A MALFUNCTIONING PORT, GRACE
*	ANOMALOUS VALUE NOT CONSIDERED IN CONTOURS

50
VERTICAL EXAGGERATION 5:1
0 250
SCALE IN FEET

NOTES: 1. THE POTENTIOMETRIC SURFACE IS BASED ON THE CONTOURED WATER LEVEL MEASUREMENT FROM THE SHALLOWEST WELLS.

2. ELEVATION IN FEET ABOVE NATIONAL GEODETIC VERTICAL DATUM.

3. SEE HSI GEOTRANS REPORT ON GRACE PROPERTY FOR DETAIL ON WATER LEVEL DRAWDOWN DUE TO GRACE PUMPING.

4. G01S, G01D, G01DB USED 5/6/97 SURVEY ELEVATION DATA.

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FIGURE 1E

POTENTIOMETRIC CROSS-SECTION L-L'
MEASURED IN APRIL, 2000

SOUTHWEST P

P' NORTHEAST

ELEVATION IN FEET (NGVD)

100 90 80 70 60 50 40 30 20 10 0 −10 −20 −30 −40 −50 −60 −70 −80 −90 −100 −110 −120 −130 −140 −150 −160 −170 −180 −190 −200

INTERSECTION OF D-D'

INTERSECTION OF E-E' - NOTE 1

INTERSECTION OF C-C'

UC22 INTER OF B-B'

UNIFIRST BUILDING

RETAINING WALL

FILL

ABLATION TILL

BEDROCK

LODGEMENT TILL

OUTWASH SAND & GRAVEL

NM

DP2 50.23 48.44 48.56

DP1 52.06 52.19

K42 53.33 53.72 53.14

S6 **

UC6S UC6I 57.43 57.46 51.95

UC15S/D 58.98 58.06

UC26D UC26S 60.45 60.52

SV7 65.83 60.69

UC29D UC29S 52.55 41.77 32.98 33.03

UC7A - NOTE 1 S71S/D - NOTE 1 61.14

SV8 UC25 UC5 60.96

UC34 UC35 UC36 70.06

SV14 UC20 51.96

TPJ TPC

UC9 18.16

36 85

EXPLANATION

- MONITORING WELL SCREEN, VALUE INDICATES WATER LEVEL ELEVATION MEASURED APRIL, 2000
- OPEN INTERVAL BETWEEN PACKERS IN MULTI LEVEL INSTALLATIONS AND PORT LOCATION
- SOIL BORING
- VAPOR PROBE
- 60 EQUAL POTENTIAL CONTOUR (DASHED WHERE INFERRED)
- GEOLOGIC CONTACT (DASHED WHERE INFERRED)
- POTENTIOMETRIC SURFACE (DASHED WHERE INFERRED)
- NM NOT MEASURED DUE TO UNFAVORABLE FIELD CONDITIONS OR A MALFUNCTIONING PORT
- * ANOMALOUS VALUE NOT CONSIDERED IN CONTOURS
- ** WATER LEVEL IN S6 NOT CONSIDERED DUE TO SCREEN LENGTH

NOTES:

1. THE POTENTIOMETRIC SURFACE IS BASED ON THE CONTOURED WATER LEVEL MEASUREMENT FROM THE SHALLOWEST WELLS.
2. UC7A AND S71 POSITIONS ADJUSTED DUE TO OVERLAP ON THIS ORIENTATION

20 VERTICAL EXAGGERATION 5:1

0 100 SCALE IN FEET

3140950

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100 STATE STREET MONTPELIER, VERMONT 05602

FIGURE 1F

POTENTIOMETRIC CROSS-SECTION P-P'
AT VERTICAL EXAGGERATION OF 5:1
MEASURED IN APRIL, 2000
WOBURN, MASSACHUSETTS

SOUTHWEST
P

NORTHEAST
P'

NOTES:

1. THE POTENTIOMETRIC SURFACE IS BASED ON THE CONTOURED WATER LEVEL MEASUREMENT FROM THE SHALLOWEST WELLS.
2. UC7A AND S71 POSITIONS ADJUSTED DUE TO OVERLAP ON THIS ORIENTATION.

ELEVATION IN FEET (NGVD)

100 90 80 70 60 50 40 30 20 10 0 −10 −20 −30 −40 −50 −60 −70 −80 −90 −100 −110 −120 −130 −140 −150 −160 −170 −180 −190 −200 −210 −220

INTERSECTION OF B–B'
INTERSECTION OF E–E'
INTERSECTION OF C–C'
UC22 INTERSECTION OF B–B'

FIRST BUILDING
RETAINING WALL

DP2 DP1 K42 S6 UC6S UC6 UC15 UC26D UC26S UC29D UC29S B1 SV7 UC7A S71/D SV5 UC25 B5 UC34 UC35 UC36 SV1 UC8 SV14 UC20 TP-1 TPC

FILL
ABLATION TILL
LODGEMENT TILL
OUTWASH SAND & GRAVEL
BEDROCK

50.23
52.06
52.19
48.44
48.56
53.33
53.72
53.14
57.43
58.98
60.45
60.52
58.06
57.46
51.95
65.83
60.55
61.14
60.69
52.55
41.77
32.98
33.03
36.85
70.08
51.96
18.16
NM

EXPLANATION

- MONITORING WELL SCREEN, VALUE INDICATES WATER LEVEL ELEVATION MEASURED APRIL, 2000
- OPEN INTERVAL BETWEEN PACKERS IN MULTI LEVEL INSTALLATIONS AND PORT LOCATION
- SOIL BORING
- VAPOR PROBE
- EQUAL POTENTIAL CONTOUR (DASHED WHERE INFERRED)
- GEOLOGIC CONTACT (DASHED WHERE INFERRED)
- POTENTIOMETRIC SURFACE (DASHED WHERE INFERRED)

NM — NOT MEASURED DUE TO UNFAVORABLE FIELD CONDITIONS OR A MALFUNCTIONING PORT

* — UC7A–5,UC6 & UC6S WATER LEVELS ARE CONSIDERED ANOMALOUS

** — WATER LEVEL IN S6 NOT CONSIDERED DUE TO SCREEN LENGTH

40 VERTICAL EXAGGERATION 2.5:1

0 100 SCALE IN FEET

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FIGURE 1G

POTENTIOMETRIC CROSS-SECTION P–P'
AT VERTICAL EXAGGERATION OF 2.5:1
MEASURED IN APRIL, 2000
WOBURN, MASSACHUSETTS

PLAN REFERENCE.
BASE PLAN PREPARED BY ENSR CONSULTING & ENGINEERING, AND PROVIDED AS A DIGITAL FILE.

250 0 250 500

SCALE IN FEET
1" = 250'-0"

EXPLANATION

- ● GROUNDWATER MONITORING POINTS
- NM NOT MEASURED
- 55 ---- LINE OF EQUAL WATER ELEVATION, FIVE FOOT CONTOUR INTERVAL, DASHED WHERE INFERRED
- * SEE OTHER SHEETS

NOTE: 1. SHALLOW BEDROCK WELLS ARE DESIGNATED AS THOSE WELLS WITHIN 50 FEET OF THE BEDROCK SURFACE. WHERE TWO WELLS ARE WITHIN 50 FEET AT ONE LOCATION, THE WELL NEAR THE BEDROCK SURFACE WAS USED.

2. WELL UC22 IS THE GROUND WATER EXTRACTION WELL OPEN TO DEEP AND SHALLOW BEDROCK AND IS INCLUDED ON THIS MAP.

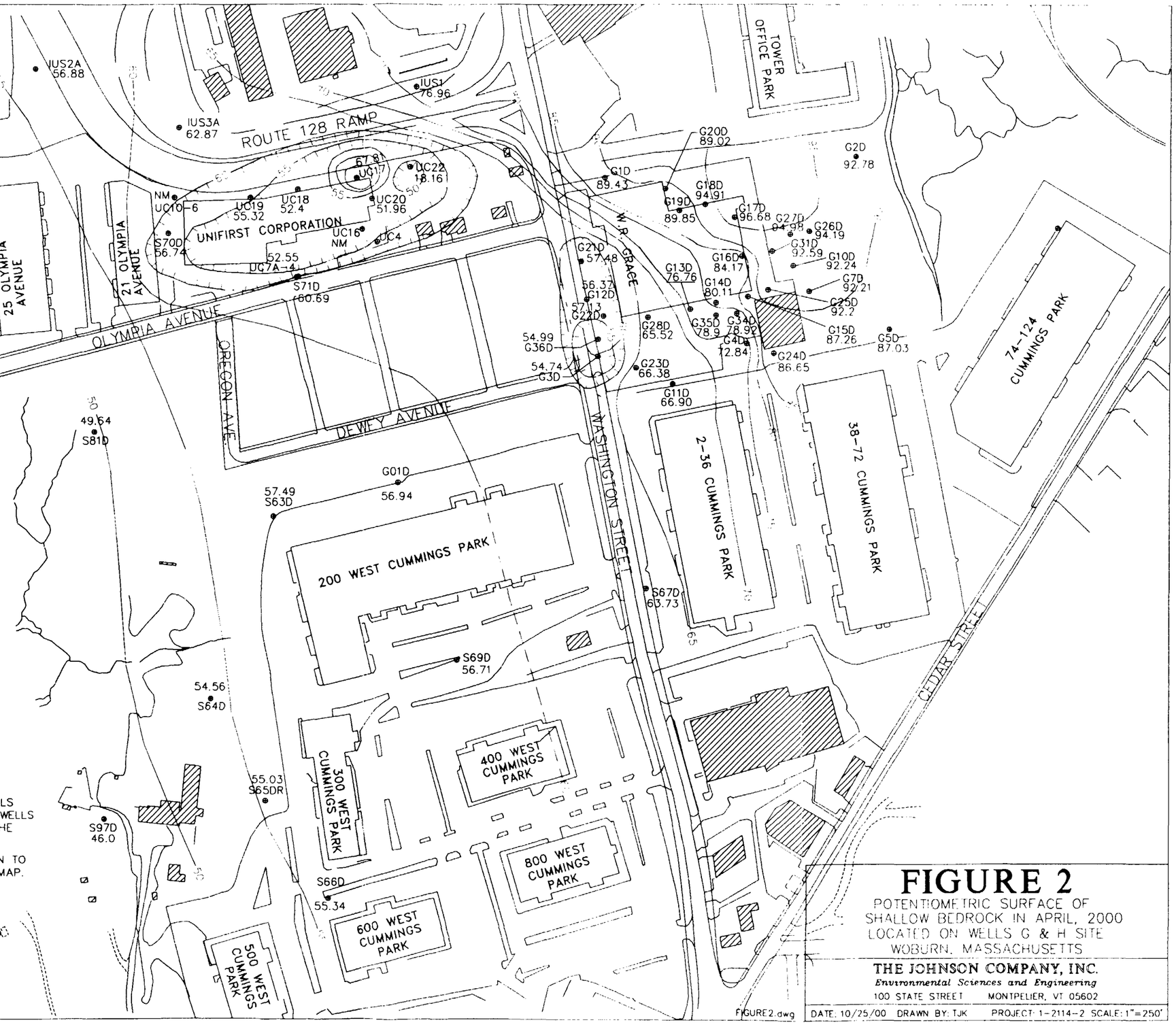

FIGURE 2

POTENTIOMETRIC SURFACE OF SHALLOW BEDROCK IN APRIL, 2000 LOCATED ON WELLS G & H SITE WOBURN, MASSACHUSETTS

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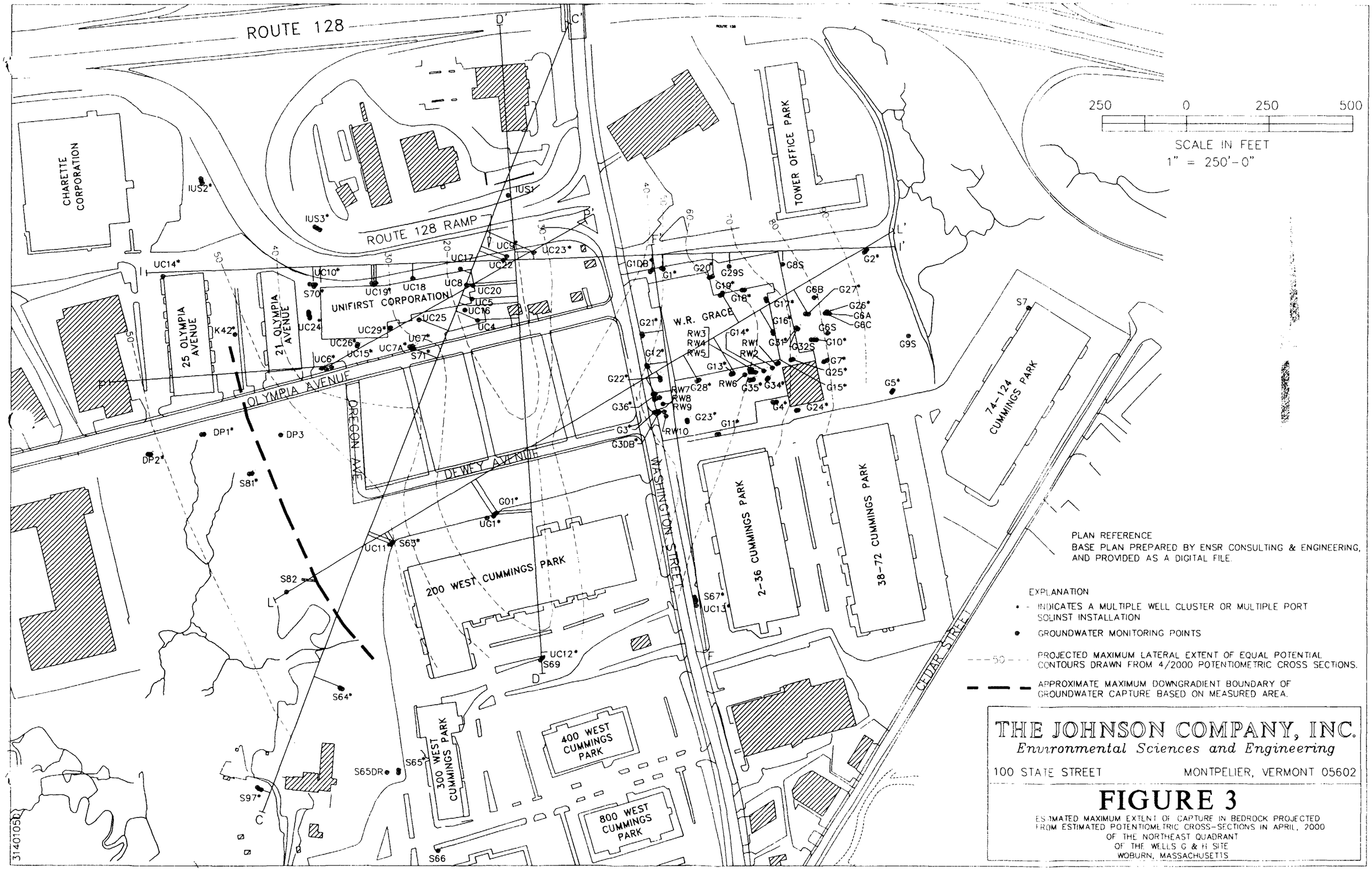
DATE: 10/25/00 DRAWN BY: TJK PROJECT: 1-2114-2 SCALE: 1"=250'

FIGURE2.dwg



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Environmental Sciences and Engineering
100 STATE STREET MONTPELIER, VERMONT 05602

FIGURE 3

ESTIMATED MAXIMUM EXTENT OF CAPTURE IN BEDROCK PROJECTED FROM ESTIMATED POTENTIOMETRIC CROSS-SECTIONS IN APRIL, 2000 OF THE NORTHEAST QUADRANT OF THE WELLS G & H SITE WOBURN, MASSACHUSETTS

3140105D

Appendix B

2000 Groundwater Elevation Data

Water Level Measurements
Wells G & H
April 2000

Well	Date	Depth to Water (feet)	Water Level Elevation (feet above NGVD)
DP1D	4/24/00	0.35	52.19
DP1S	4/24/00	0.22	52.06
DP2D	4/24/00	2.99	48.56
DP2M	4/24/00	3.15	48.44
DP2S	4/24/00	1.54	50.23
DP3	4/24/00	5.18	54.45
DP36	4/24/00	1.89	56.89
DP37D	4/24/00	6.83	52.70
DP37S	4/24/00	2.75	56.83
GO1D	4/24/00	16.14	56.94
GO1DB	4/24/00	31.53	41.52
GO1S	4/24/00	15.95	57.17
IUS1	4/24/00	11.17	76.96
IUS2A	4/24/00	6.23	56.88
IUS2B	4/24/00	5.25	57.33
IUS2C	4/24/00	5.35	57.88
IUS3A	4/24/00	3.98	62.87
IUS3B	4/24/00	6.05	61.02
IUS3C	4/24/00	5.86	61.21
K42D	4/24/00	2.68	53.14
K42M	4/24/00	2.52	53.72
K42S	4/24/00	2.57	53.33
S63D	4/24/00	11.93	57.49
S63D	4/28/00	11.73	57.69
S63S	4/24/00	11.76	57.74
S63S	4/28/00	11.68	57.82
S64D	4/26/00	5.26	54.56
S64M	4/26/00	4.85	54.81
S64S	4/26/00	4.95	54.50
S65DR	4/26/00	24.86	55.03
S65M	4/26/00	20.99	55.45
S65S	4/26/00	20.93	55.49
S66D	4/24/00	14.83	55.34
S67D	4/24/00	19.32	63.73
S67M	4/24/00	16.99	66.04
S67S	4/24/00	15.25	67.81
S69D	4/25/00	19.12	56.38
S69D	4/28/00	18.79	56.71
S70D	4/24/00	13.09	56.74
S70D	4/28/00	12.54	57.29
S70M	4/24/00	10.11	59.80
S70M	4/28/00	10.75	59.16
S70S	4/24/00	11.83	57.63
S70S	4/28/00	11.44	58.02
S71D	4/25/00	10.43	60.69

Well	Date	Depth to Water (feet)	Water Level Elevation (feet above NGVD)
S71S	4/25/00	10.17	61.14
S7R	4/24/00	2.75	93.02
S81D	4/24/00	6.30	49.64
S81M	4/24/00	5.90	51.48
S81S	4/24/00	3.77	52.16
S82	4/26/00	9.38	49.07
S97D	4/26/00	4.85	46.00
S97M	4/26/00	5.54	45.88
S97S	4/26/00	5.17	46.88
UC10-1	4/28/00	30.06	39.54
UC10-2	4/28/00	27.76	41.84
UC10-3	4/28/00	NM	NM
UC10-4	4/28/00	18.85	50.75
UC10-5	4/28/00	NM	NM
UC10-6	4/28/00	NM	NM
UC10D	4/24/00	11.67	57.76
UC10D	4/28/00	10.94	58.49
UC10M	4/24/00	10.75	58.87
UC10M	4/28/00	10.27	59.35
UC10S	4/24/00	10.34	59.14
UC10S	4/28/00	9.88	59.60
UC11-1	4/28/00	NM	NM
UC11-2	4/28/00	16.79	53.41
UC11-3	4/28/00	NM	NM
UC11-4	4/28/00	NM	NM
UC11-5	4/28/00	NM	NM
UC11-6	4/28/00	NM	NM
UC12-1	4/28/00	NM	NM
UC12-2	4/28/00	40.87	33.93
UC12-3	4/25/00	NM	NM
UC12-4	4/28/00	NM	NM
UC12-5	4/28/00	17.62	57.18
UC12-6	4/28/00	NM	NM
UC15D	4/24/00	33.35	36.85
UC15S	4/24/00	18.70	51.95
UC16	4/24/00	NM	NM
UC17	4/24/00	5.47	67.81
UC18	4/24/00	20.55	52.40
UC19	4/24/00	15.33	55.32
UC19M	4/24/00	9.20	61.51
UC19S	4/24/00	9.30	61.47
UC20	4/24/00	20.91	51.96
UC22	4/24/00	67.37	18.16
UC23-1	4/24/00	61.09	28.80
UC23-2	4/24/00	59.37	30.52
UC23-3	4/24/00	87.61	2.28
UC23-4	4/24/00	54.56	35.33
UC23-5	4/24/00	52.62	37.27

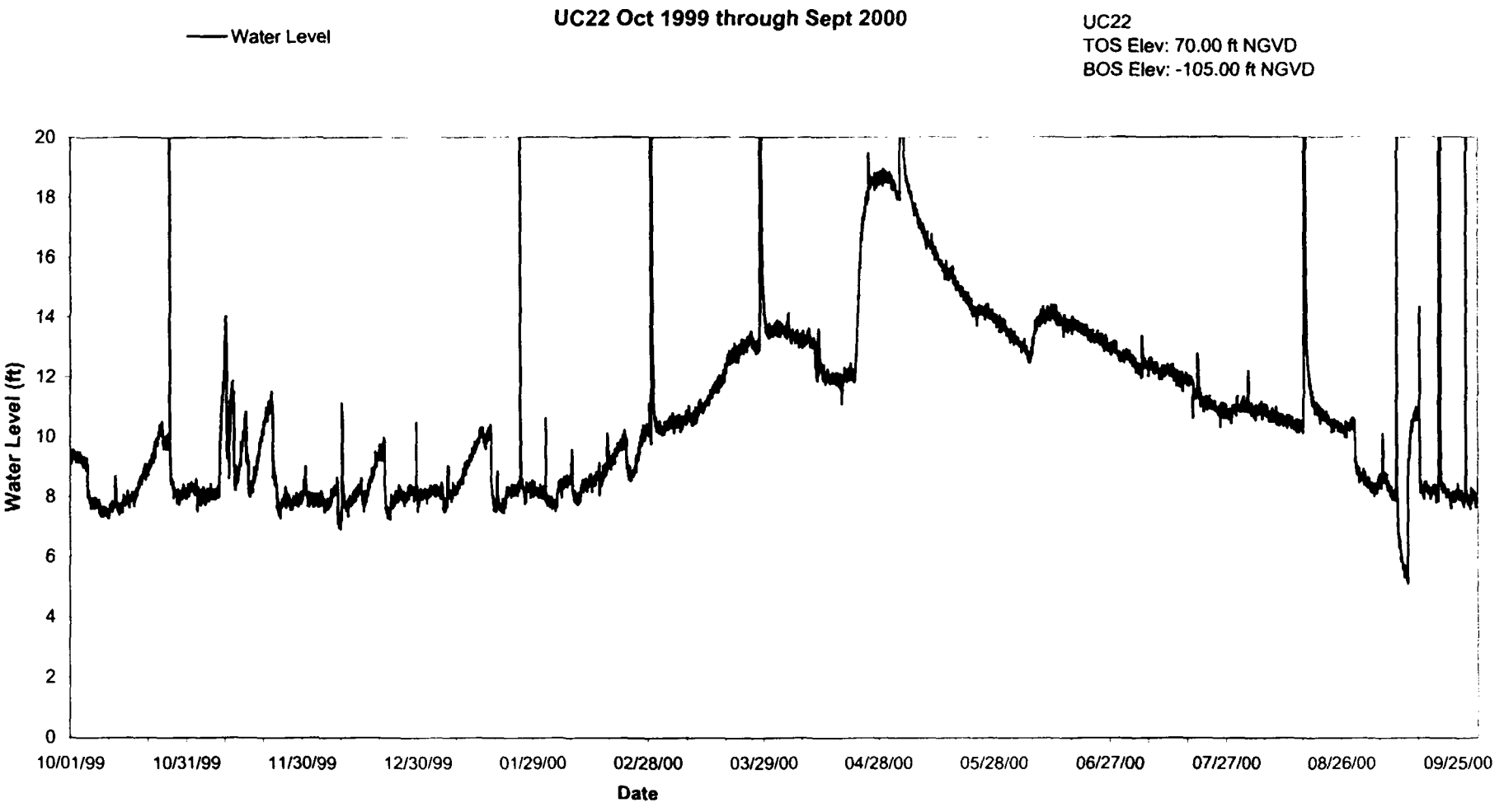
Well	Date	Depth to Water (feet)	Water Level Elevation (feet above NGVD)
UC24D	4/24/00	12.08	57.62
UC24D	4/28/00	12.35	57.35
UC24S	4/24/00	12.33	57.44
UC24S	4/28/00	11.85	57.92
UC25	4/24/00	10.77	60.96
UC26D	4/24/00	10.81	58.06
UC26S	4/24/00	9.88	58.98
UC29D	4/24/00	9.90	60.52
UC29S	4/24/00	10.10	60.45
UC30	4/24/00	12.63	60.84
UC31D	4/24/00	12.77	56.26
UC31M	4/24/00	13.64	55.26
UC31S	4/24/00	10.37	58.78
UC32	4/25/00	4.78	67.84
UC33	4/25/00	7.55	64.99
UC34	4/25/00	****	****
UC35	4/25/00	****	****
UC36	4/25/00	****	****
UC5	4/24/00	10.33	62.34
UC6	4/28/00	10.62	57.46
UC6S	4/24/00	9.93	57.43
UC7A-1	4/24/00	35.55	33.03
UC7A-2	4/24/00	35.60	32.98
UC7A-3	4/24/00	26.81	41.77
UC7A-4	4/24/00	16.03	52.55
UC7A-5	4/24/00	2.75	65.83
UC8	4/24/00	3.80	70.06
UC9-2	4/28/00	NM	NM
UC9-4	4/28/00	NM	NM
UC9-6	4/28/00	NM	NM
UG1-1	4/24/00	34.57	37.57
UG1-2	4/24/00	27.44	44.70
UG1-3	4/24/00	NM	NM
UG1-4	4/24/00	32.50	39.64
UG1-5	4/24/00	44.73	27.41
UG1-6	4/24/00	NM	NM
UG1-7	4/24/00	33.79	38.35

Notes: **** Well was dry
NM Well was not measured.

Appendix C

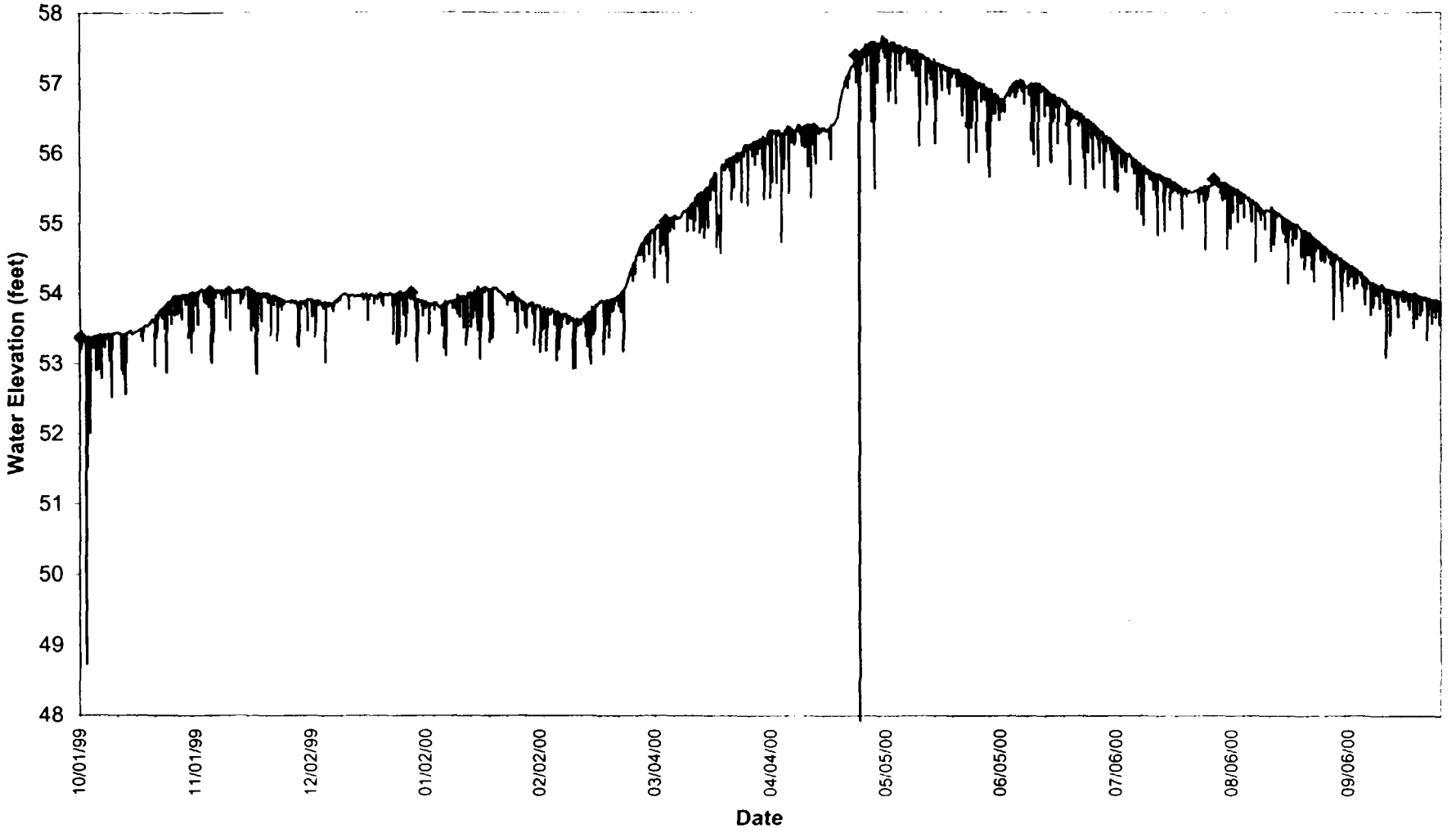
Data Logger Hydrographs

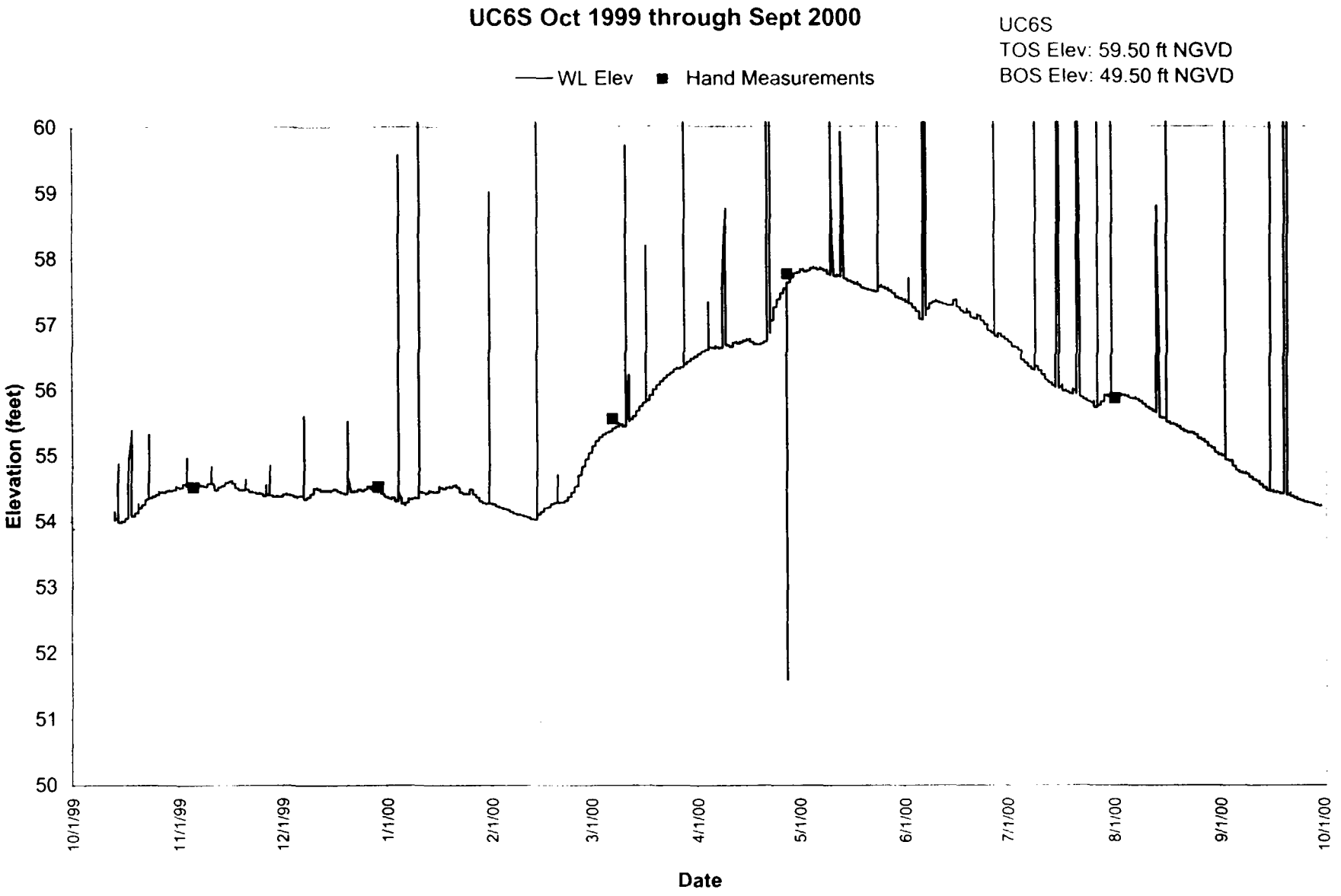
October 1999 – September 2000


UC22 Oct 1999 through Sept 2000
Water Level
UC22
TOS Elev: 70.00 ft NGVD
BOS Elev: -105.00 ft NGVD
Water Level (ft)
20
18
16
14
12
10
8
6
4
2
0
10/01/99
10/31/99
11/30/99
12/30/99
01/29/00
02/28/00
03/29/00
04/28/00
05/28/00
06/27/00
07/27/00
08/26/00
09/25/00
Date

UC6 Oct 1999 through Sept 2000

UC6
TOS Elev: 35.00 ft NGVD
BOS Elev: 25.00 ft NGVD




UC6S Oct 1999 through Sept 2000
WL Elev
Hand Measurements
UC6S
TOS Elev: 59.50 ft NGVD
BOS Elev: 49.50 ft NGVD
Elevation (feet)
60
59
58
57
56
55
54
53
52
51
50
10/1/99
11/1/99
12/1/99
1/1/00
2/1/00
3/1/00
4/1/00
5/1/00
6/1/00
7/1/00
8/1/00
9/1/00
10/1/00
Date

Appendix D

April 2000 Groundwater Quality Data

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000
Sample Date: 4/27/00
Sample Location: GO1DB Sample Name: GO1BA

Acetone	2 J	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	0.8 J	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	U(1)	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	U(1)	ug/L
Cis-1,2-Dichloroethene	U(2)	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	26	ug/L
Toluene	U(1)	ug/L
1,1,1-Trichloroethane	U(1)	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	2	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/26/00
Sample Location: S70D Sample Name: S70DA

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	U(1)	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	U(1)	ug/L
Cis-1,2-Dichloroethene	U(2)	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	3	ug/L
Toluene	U(1)	ug/L
1,1,1-Trichloroethane	U(1)	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	U(1)	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/26/00
Sample Location: S71D Sample Name: S71DA

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	U(1)	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	U(1)	ug/L
Cis-1,2-Dichloroethene	U(2)	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	49 J	ug/L
Toluene	U(1)	ug/L
1,1,1-Trichloroethane	1	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	0.5 J	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/28/00
Sample Location: S71S Sample Name: S71SA

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	U(1)	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	U(1)	ug/L
Cis-1,2-Dichloroethene	U(2)	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	89	ug/L
Toluene	U(1)	ug/L
1,1,1-Trichloroethane	1	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	0.8 J	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/26/00
Sample Location: S81D Sample Name: S81DA

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	0.5 J	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	U(1)	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	1	ug/L
Cis-1,2-Dichloroethene	1 J	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	180 J	ug/L
Toluene	U(1)	ug/L
1,1,1-Trichloroethane	4	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	5	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/26/00
Sample Location: S81M Sample Name: S81MA

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	0.8 J	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	U(1)	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	2	ug/L
Cis-1,2-Dichloroethene	2 J	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	150	ug/L
Toluene	U(1)	ug/L
1,1,1-Trichloroethane	8	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	4	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/26/00
Sample Location: S81S Sample Name: S81SA

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	U(1)	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	1	ug/L
Cis-1,2-Dichloroethene	U(2)	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	14	ug/L
Toluene	U(1)	ug/L
1,1,1-Trichloroethane	4	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	0.5 J	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/28/00
Sample Location: UC10-1 Sample Name: U101A

Acetone	4 J	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	2	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	0.9 J	ug/L
Cis-1,2-Dichloroethene	350	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	250	ug/L
Toluene	60	ug/L
1,1,1-Trichloroethane	2	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	68	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/26/00
Sample Location: UC10-2 Sample Name: U102A

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	0.6 J	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	U(1)	ug/L
Cis-1,2-Dichloroethene	100	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	130	ug/L
Toluene	28	ug/L
1,1,1-Trichloroethane	0.6 J	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	41	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	0.5 J	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/26/00
Sample Location: UC10-3 Sample Name: U103A

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	0.6 J	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	U(1)	ug/L
Cis-1,2-Dichloroethene	140	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	0.5 JB	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	77	ug/L
Toluene	21	ug/L
1,1,1-Trichloroethane	U(1)	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	27	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/26/00
Sample Location: UC10-4 Sample Name: U104A

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	U(1)	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	U(1)	ug/L
Cis-1,2-Dichloroethene	71	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	87	ug/L
Toluene	22	ug/L
1,1,1-Trichloroethane	0.5 J	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	26	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/26/00
Sample Location: UC10-5 Sample Name: U105A

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	3 J	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	U(1)	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	U(1)	ug/L
Cis-1,2-Dichloroethene	110	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	56	ug/L
Toluene	19	ug/L
1,1,1-Trichloroethane	U(1)	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	22	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/26/00
Sample Location: UC10-6 Sample Name: U106A

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	U(1)	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	U(1)	ug/L
Cis-1,2-Dichloroethene	28	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	18	ug/L
Toluene	4	ug/L
1,1,1-Trichloroethane	U(1)	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	9	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/26/00
Sample Location: UC10D Sample Name: UC10DA

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	U(1)	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	U(1)	ug/L
Cis-1,2-Dichloroethene	U(2)	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	U(1)	ug/L
Toluene	U(1)	ug/L
1,1,1-Trichloroethane	U(1)	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	U(1)	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/26/00

Sample Location: UC10M Sample Name: UC10MA

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	U(1)	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	U(1)	ug/L
Cis-1,2-Dichloroethene	U(2)	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	U(1)	ug/L
Toluene	U(1)	ug/L
1,1,1-Trichloroethane	U(1)	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	U(1)	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/26/00
Sample Location: UC10S **Sample Name:** UC10SA

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	U(1)	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	U(1)	ug/L
Cis-1,2-Dichloroethene	U(2)	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	U(1)	ug/L
Toluene	U(1)	ug/L
1,1,1-Trichloroethane	U(1)	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	U(1)	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/28/00
Sample Location: UC11-2 Sample Name: U112A

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	1	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	0.6 J	ug/L
Cis-1,2-Dichloroethene	160	ug/L
Trans-1,2-dichloroethene	1 J	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	110	ug/L
Toluene	9	ug/L
1,1,1-Trichloroethane	U(1)	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	71	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/28/00
Sample Location: UC6 Sample Name: XUC6A

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	U(1)	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	U(1)	ug/L
Cis-1,2-Dichloroethene	U(2)	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	43	ug/L
Toluene	U(1)	ug/L
1,1,1-Trichloroethane	U(1)	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	3	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT

WELLS G & H SITE, April 2000

Sample Date: 4/27/00

Sample Location: UC6S Sample Name: UC6SA

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	U(1)	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	U(1)	ug/L
Cis-1,2-Dichloroethene	U(2)	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	2	ug/L
Toluene	U(1)	ug/L
1,1,1-Trichloroethane	U(1)	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	U(1)	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/27/00
Sample Location: UC7-1 **Sample Name:** UC71A

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	0.6 J	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	13	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	8	ug/L
Cis-1,2-Dichloroethene	14	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	3500	ug/L
Toluene	47	ug/L
1,1,1-Trichloroethane	42	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	71	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	0.5 J	ug/L

NOTES. U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/27/00
Sample Location: UC7-2 Sample Name: UC72A

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	0.5 J	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	33	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	10	ug/L
Cis-1,2-Dichloroethene	31	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	0.5 JB	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	4800	ug/L
Toluene	25	ug/L
1,1,1-Trichloroethane	74	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	69	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/27/00
Sample Location: UC7-3 Sample Name: UC73A

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	0.6 J	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	20	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	12	ug/L
Cis-1,2-Dichloroethene	20	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	2600	ug/L
Toluene	26	ug/L
1,1,1-Trichloroethane	62	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	64	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/27/00
Sample Location: UC7-4 Sample Name: UC74A

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	5	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	3	ug/L
Cis-1,2-Dichloroethene	22	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	18 JB	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	1600	ug/L
Toluene	9	ug/L
1,1,1-Trichloroethane	24	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	43	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000
Sample Date: 4/27/00
Sample Location: UC7-5 Sample Name: UC75A

Acetone	U(5)	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	U(5)	ug/L
Carbon disulfide	U(1)	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	2	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	1	ug/L
Cis-1,2-Dichloroethene	120	ug/L
Trans-1,2-dichloroethene	U(2)	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	190	ug/L
Toluene	9	ug/L
1,1,1-Trichloroethane	6	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	32	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

WATER QUALITY SUMMARY REPORT
WELLS G & H SITE, April 2000

Sample Date: 4/28/00
Sample Location: UG1-4 Sample Name: UG14A

Acetone	5	ug/L
Benzene	U(1)	ug/L
Bromoform	U(1)	ug/L
Bromomethane	U(2)	ug/L
2-Butanone	18	ug/L
Carbon disulfide	1	ug/L
Carbon tetrachloride	U(1)	ug/L
Chlorobenzene	U(1)	ug/L
Dibromochloromethane	U(1)	ug/L
Chloroethane	U(2)	ug/L
Chloroform	U(1)	ug/L
Chloromethane	U(2)	ug/L
Bromodichloromethane	U(1)	ug/L
1,1-Dichloroethane	0.8 J	ug/L
1,2-Dichloroethane	U(1)	ug/L
1,1-Dichloroethene	U(1)	ug/L
Cis-1,2-Dichloroethene	140	ug/L
Trans-1,2-dichloroethene	17	ug/L
1,2-Dichloropropane	U(1)	ug/L
Cis-1,3-Dichloropropene	U(1)	ug/L
Trans-1,3-Dichloropropene	U(1)	ug/L
Ethylbenzene	U(1)	ug/L
2-Hexanone	U(4)	ug/L
Methylene chloride	U(1)	ug/L
4-Methyl-2-Pentanone	U(3)	ug/L
Styrene	U(1)	ug/L
1,1,2,2-Tetrachloroethane	U(1)	ug/L
Tetrachloroethene	2	ug/L
Toluene	2	ug/L
1,1,1-Trichloroethane	U(1)	ug/L
1,1,2-Trichloroethane	U(1)	ug/L
Trichloroethene	29	ug/L
Vinyl chloride	U(2)	ug/L
Xylenes (total)	U(1)	ug/L

NOTES: U - Compound not detected at limit indicated in Parentheses.
J - Estimated Value.
B - Compound Detected in Blank.

Appendix E

Annual Inspection Report

Annual Maintenance Checklist

UniFirst Ground Water Treatment System
Woburn, Massachusetts

I. Diaphragm Check Valve

Manufactured by CLA-VAL CO., Model 81-01, 2" angle style

Inspect the diaphragm, disc and seat o-ring carefully for signs of wear, corrosion or other abnormal condition (refer to manufacturer's literature). Replace these parts unless the inspection indicates they are free of wear or other abnormal condition.

Date Inspected 09/20/00

Inspector Bryan Moccoy

Mass. Plumber's License No: 10364

Parts Replaced

Diaphragm	✓ Yes	o No
Disc	✓ Yes	o No
Seat O-ring	✓ Yes	o No

II. Pressure Reducing Valve

Manufactured by WATTS REGULATOR, Model 223LP, 1½"

Inspect the diaphragm, seat, disc and gaskets carefully for signs of wear, corrosion or other abnormal condition (refer to manufacturer's literature). Replace these parts unless the inspection indicates they are free of wear or other abnormal condition.

Date Inspected 10/11/00

Inspector Bryan J Moccoy

Mass. Plumber's License No: 10364

Parts Replaced Replaced whole valve

Diaphragm	o Yes	o No
Disc	o Yes	o No
Seat	o Yes	o No
Seat Gasket	o Yes	o No
Bottom Plug Gasket	o Yes	o No
Disc Screw	o Yes	o No

If additional maintenance activities are performed, list them on a separate page and include the following information:

Date, component, description of problem, description of maintenance performed and remedial recommendations (if appropriate).

Annual Inspection Report

UniFirst Ground Water Treatment System
Woburn, Massachusetts

Date 9/9/00
Operator KP/mc

I. UC22 Well Head

Remove any debris around the well head.

Condition of well cap good

Signs of wear or abuse ○ Yes ☒ No Describe

Condition of pressure transducer junction box good

Condition of desiccant (replace if pink) OK

II. Influent Pipe Corridor

Evidence of settlement ○ Yes ✓ No

Evidence of leakage ○ Yes ✓ No

III. Discharge Pipe Corridor

Evidence of settlement ○ Yes ✓ No

Evidence of leakage ○ Yes ✓ No

Open and inspect the two cleanouts located at 90° bends on the discharge line.

Remove valve box cover and 4" threaded plug.

Condition of 1st cleanout (outside treatment room) good

Condition of 2nd cleanout (@NW corner of site) good

IV. Discharge Outfall at the Aberjona River

Describe conditions not visible

V. Treatment System Piping and Valving

Inspect all piping, fittings and valving for leakage and signs of rust. With the treatment system off, exercise all valves through their complete range of operation and restore to their original position. Complete the following table to assure that every valve is exercised. Indicate the sequence of operation: Found Open - Closed - Left Open (OCO) or Found Closed - Opened - Left Closed (COC). Inspect and indicate the condition of each valve tag, replace as needed and so note on the table.

Valve Inspection & Exercise Record

Valve	Exercise Sequence	ID Tag Condition	Valve	Exercise Sequence	ID Tag Condition
B1	autovalve	OK	B101	OCO	OK
B2	OCO	OK	B102	NA	
B3	OCO	OK	B106	COC	OK
B4	OCO	OK	B222	—	
B5	OCO	OK	B333	—	
B6	COC	OK	B444	NA	
B7	COC	OK	B555	NA	
B8	OCO	OK	G-1	OCO	OK
B9	OCO	OK	G-2	COC	OK
B10	COC	OK	G-3	COC	OK
B11	COC	OK	G-6	OCO	OK
B12	COC	OK	G-7	OCO	OK
B13	OCO	OK	F1	OCO	replaced
B14	COC	OK	F2	OCO	OK
B15	COC	OK	F3	COC	OK
B16	OCO	OK	F4	NA	OK
B17	COC	OK	F5	COC	OK
B18	OCO	OK			
B19	OCO	OK			
B20	COC	OK			
B21	OCO	OK			
B22	OCO	OK			
B23	OCO	OK			
B24	COC	OK			
B25	COC	OK			
B26	COC	OK			
B27	OCO	OK			
B27A	OCO	OK			

VI. Treatment System Tankage

Visually inspect the tankage associated with the treatment system. This includes: the multi-media filter; the carbon tanks; the backwash settling tank; and the discharge tank; Inspect the tanks for general condition, at every weld or seam and at each pipe connection. The clamps at either end of the carbon hoses must be checked and tightened if necessary.

Multi-Media Filter
General Condition good
Condition of Welds good
Condition at pipe penetrations good

Cartridge Filter
General Condition good
Condition of Welds good

Carbon Tanks
General Condition good
Condition of Welds good
Condition at pipe penetrations good
Condition of carbon hoses & hose clamps good

Backwash Settling Tank
General Condition good
Condition at pipe penetrations good

Discharge Tank
General Condition good
Condition at pipe penetrations good

VII. **Backwash Multi-media Filter**

Backwash the multi-media filter following the procedure in Section 3.4.1 of the O&M Manual. Backwash to be performed during the Annual Inspection, unless previously accomplished during the year of operation.

Backwash Performed: 8/29/00 Duration (minutes): _____

VIII. **Cartridge Filter**

Open cartridge and remove filter element.
Clean the filter element per the manufacturer's recommendations.
Collect the rinsate in a drum designated for this purposed.

IX. **Floor Sump Pump (P7)**

Inspect and test the floor sump.
General Condition good
Pump Operation good
Clean suction screen on bottom of pump.

X. **Hydrogen Peroxide Containment Structure**

Inspect the containment structure and lining. Remove any debris that may have accumulated.
General Condition good
Liner Condition good

XI. Floor to Wall Seal and Containment Curbs

Inspect the condition of the floor to wall seal along the south and west walls of the treatment room. Check the seal for tears, abrasions and continuity with the walls and floor. Inspect the containment curbing at the doors to the treatment room and those adjacent to the discharge tank. Check to assure the curbing is bonded to the concrete slab.

Floor to Wall Seal general condition: good

Containment curbs general condition: good

XII. Emergency Eyewash/Shower

Test and inspect the emergency eyewash and shower.

Eyewash - tested: ✓ Yes ○ No — General condition: good

Shower - tested: ✓ Yes ○ No — General condition: good

XIII. Pressure Relief Valve and Flow Switch

Test and inspect the pressure relief valve (system must be operating) and the flow switch.

Test pressure relief valve and note response:

Well Pump (P1) shut down? ✓ Yes ○ No

Annunciator #2 Lit? ✓ Yes ○ No

Dial Out Routine Activated? ✓ Yes ○ No

Relief value and flow switch general condition: good

XIV. High Level Electrodes - Backwash Tank & Floor Sump

Test and inspect the high level electrode assemblies for the backwash settling tank and floor sump.
Disconnect the modem telephone line to avoid alarm callouts.
Simulate a high level condition by immersing the sensors in a container of water. Test the level sensors with the well pump operating and note the responses.

Backwash Settling Tank

Test high level electrodes and note response:

Well Pump (P1) shut down? ✓ Yes ○ No

Annunciator #1 Lit? ✓ Yes ○ No

General condition of the electrode assembly: good

Floor Sump

Test high level electrodes and note response:

Well Pump (P1) shut down? ✓ Yes ○ No

Annunciator #2 Lit? ✓ Yes ○ No

General condition of the electrode assembly: good

Remember to reconnect the modem telephone line.

XV. Ventilation System

Test the operation of and inspect the vent fan and make-up louvers.

Vent Fan

Test Operation: OK — General Condition: good

Make-up Air Louvers

Test Operation: OK — General Condition: good

XVI. Data Logger

Open the datalogger enclosure and replace the desiccant.

XVII. Recommendations

Record below any recommendations to the treatment system operation or maintenance.

Replaced cartridge filter

Replaced valve B15

Appendix F

Treatment Plant Monitoring Data

Influent (S-1)
UV Effluent (S5UV)
Carbon #1 Effluent (S5C)
Final Effluent (S6 & S7)

Sample Location S1, influent from UC22
UniFirst Ground Water Treatment Facility
Woburn, Massachusetts

Method 8260

	Laboratory Results (µg/l)				
Date	1,1,1-TCA	1,1-DCE	1,2-DCE	PCE	TCE
14-Sep-99	4 J	-	-	810	35
02-Nov-99	4 J	-	-	650	38
04-Jan-00	5	-	-	740	36
07-Mar-00	5	-	-	710	26
02-May-00	4	-	-	640	15
05-Jul-00	4	-	4	570	28
05-Sep-00	3	-	-	450	20

Sample Location S5UV, effluent from UV Unit
UniFirst Ground Water Treatment Facility
Woburn, Massachusetts

Method 601

	Laboratory Results (µg/l)				
Date	1,1,1-TCA	1,1-DCE	1,2-DCE	PCE	TCE
05-Oct-99	3.9	-	-	-	-
02-Nov-99	3.9	-	-	-	-
07-Dec-99	4.1	-	-	-	-
04-Jan-00	3.6	-	-	-	-
01-Feb-00	3.2	-	-	-	-
07-Mar-00	3.7	-	-	-	-
04-Apr-00	3.2	-	-	-	-
02-May-00	3.7	-	-	-	-
06-Jun-00	2.8	-	-	-	-
05-Jul-00	3	-	-	-	-
01-Aug-00	3	-	-	-	-
05-Sep-00	2.5	-	-	-	-

Sample Location S5C, effluent from 1st carbon tank
UniFirst Ground Water Treatment Facility
Woburn, Massachusetts

Method 601

	Laboratory Results (µg/l)				
Date	**1,1,1-TCA**	**1,1-DCE**	**1,2-DCE**	**PCE**	**TCE**
05-Oct-99	3.7	-	-	-	-
02-Nov-99	4	-	-	-	-
07-Dec-99	3.9	-	-	-	-
04-Jan-00	3.8	-	-	-	-
01-Feb-00	3.5	-	-	-	-
07-Mar-00	3.9	-	-	-	-
04-Apr-00	3.9	-	-	-	-
02-May-00	4.4	-	-	-	-
06-Jun-00	2.5	-	-	-	-
05-Jul-00	2.9	-	-	-	-
01-Aug-00	3	-	-	-	-
05-Sep-00	3	-	-	-	-

Sample Location S6, *final effluent*
UniFirst Ground Water Treatment Facility
Woburn, Massachusetts

EPA Method 524.2

	Laboratory Results (µg/l)					
Date	**1,1,1-TCA**	**1,1-DCE**	**1,2-DCE**	**PCE**	**TCE**	**Lead**
Limit	**None**	**7**	**70**	**5**	**5**	**10.2**
05-Oct-99	5	-	0.5	0.3J	0.3J	<1
02-Nov-99	5	0.9	0.5	0.4J	0.4J	
07-Dec-99	-	-	-	-	-	<1.1
7-Dec-99 S7	-	-	-	-	-	
04-Jan-00	0.6	-	-	-	-	<0.97
01-Feb-00	2	-	-	-	-	<0.68
07-Mar-00	3	-	-	-	-	<0.68
04-Apr-00	3	-	-	-	-	<1.48
02-May-00	4	-	-	-	-	<0.68
06-Jun-00	3	-	-	-	-	<1.48
06-Jun-00 S7	4	-	-	-	-	
05-Jul-00	4	-	-	-	-	<1.48
01-Aug-00	4	-	-	-	-	<1.6
05-Sep-00	4	-	-	-	-	<1.6

S7 is a duplicate of S6

Appendix G

TCL/TAL Analytical Report

Katahdin
ANALYTICAL SERVICES

CLIENT: BRIAN KEEGAN
UNIFIRST CORPORATION
68 JONSPIN ROAD
WILMINGTON, MA 01887

Lab Number : WQ-1223-3
Report Date: 06/09/00
PO No. : 05.03.00
Project : WOBURN GW TREATMENT SYSTEM

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
S6	Aqueous	CLIENT	05/02/00	05/03/00

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Cyanide, Total	<10	µg/L	1	10	335.4	05/08/00	PG	1

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 05/03/00 by CBU

06/09/00

LJO/ejnajc(dw)
QE09CNW2
CC: HARVARD PROJECT SERVICES
325 AYER ROAD
SUITE B-201
HARVARD, MA 01451-1132

Katahdin Analytical Services, Inc.

REPORT OF ANALYTICAL RESULTS

Client: BRIAN KEEGAN
UNIFIRST CORPORATION
68 JONSPIN ROAD
WILMINGTON, MA 01887

Lab Sample ID: WQ1223-3
SDG: WQ1223
Report Date: 05/12/2000
PO No.: 05.03.00
Project: WOBURN GW TREATMENT SYSTEM
Percent Solids: N/A
Analytical Method: SW846 8081A

Sample Description	Matrix	Date Sampled	Date Received	Date Prepped	Prep Chemist	Preparative Method
S6	Aqueous	05/02/2000	05/03/2000	05/05/2000	DS	SW846 3520

Analyte	Qualifier	Result	Units	DF	Sample PQL	Method PQL	Date Analyzed	Analyst
alpha-BHC		< 0.050	ug/L	1.0	0.050	0.050	05/11/2000	DBG
gamma-BHC (Lindane)		< 0.050	ug/L	1.0	0.050	0.050	05/11/2000	DBG
Heptachlor		< 0.050	ug/L	1.0	0.050	0.050	05/11/2000	DBG
Aldrin		< 0.050	ug/L	1.0	0.050	0.050	05/11/2000	DBG
beta-BHC		< 0.050	ug/L	1.0	0.050	0.050	05/11/2000	DBG
delta-BHC		< 0.050	ug/L	1.0	0.050	0.050	05/11/2000	DBG
Heptachlor epoxide		< 0.050	ug/L	1.0	0.050	0.050	05/11/2000	DBG
Endosulfan I		< 0.050	ug/L	1.0	0.050	0.050	05/11/2000	DBG
4,4'-DDE		< 0.10	ug/L	1.0	0.10	0.10	05/11/2000	DBG
Dieldrin		< 0.10	ug/L	1.0	0.10	0.10	05/11/2000	DBG
Endrin		< 0.10	ug/L	1.0	0.10	0.10	05/11/2000	DBG
4,4'-DDD		< 0.10	ug/L	1.0	0.10	0.10	05/11/2000	DBG
Endosulfan II		< 0.10	ug/L	1.0	0.10	0.10	05/11/2000	DBG
4,4'-DDT		< 0.10	ug/L	1.0	0.10	0.10	05/11/2000	DBG
Endrin aldehyde		< 0.10	ug/L	1.0	0.10	0.10	05/11/2000	DBG
EndoSulfan sulfate		< 0.10	ug/L	1.0	0.10	0.10	05/11/2000	DBG
Methoxychlor		< 0.50	ug/L	1.0	0.50	0.50	05/11/2000	DBG
Toxaphene		< 1.0	ug/L	1.0	1.0	1.0	05/11/2000	DBG
alpha-Chlordane		< 0.050	ug/L	1.0	0.050	0.050	05/11/2000	DBG
gamma-Chlordane		< 0.050	ug/L	1.0	0.050	0.050	05/11/2000	DBG
Endrin ketone		< 0.10	ug/L	1.0	0.10	0.10	05/11/2000	DBG
2,4,5,6-Tetrachloro-meta-xylene		83	%	1.0			05/11/2000	DBG
Decachlorobiphenyl		98	%	1.0			05/11/2000	DBG

1

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services **Client Field ID:** S6

Matrix: WATER **SDG Name:** WQ1223

Percent Solids: 0.00 **Lab Sample ID:** WQ1223-003

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	118			P	1
7440-36-0	ANTIMONY	2.32	U		P	1
7440-38-2	ARSENIC	1.98	U		P	1
7440-39-3	BARIUM	21.4			P	1
7440-41-7	BERYLLIUM	0.56	U		P	1
7440-43-9	CADMIUM	2.61	U		P	1
7440-70-2	CALCIUM	121000			P	1
7440-47-3	CHROMIUM	4.02	U		P	1
7440-48-4	COBALT	2.98	U		P	1
7440-50-8	COPPER	1.93	U		P	1
7439-89-6	IRON	20.5	B		P	1
7439-92-1	LEAD	1.48	U		P	1
7439-95-4	MAGNESIUM	14600			P	1
7439-96-5	MANGANESE	1.34	U		P	1
7439-97-6	MERCURY	0.02	U		CV	1
7440-02-0	NICKEL	11.90	U		P	1
7440-09-7	POTASSIUM	2570			P	1
7782-49-2	SELENIUM	2.98	U		P	1
7440-22-4	SILVER	2.74	U		P	1
7440-23-5	SODIUM	107000			P	1
7440-28-0	THALLIUM	3.28	U		P	1
7440-62-2	VANADIUM	4.01	U		P	1
7440-66-6	ZINC	6.0	B		P	1

Color Before: COLORLESS Clarity Before: CLEAR

Color After: COLORLESS Clarity After: CLEAR

Comments:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: BRIAN KEEGAN
UNIFIRST CORPORATION
68 JONSPIN ROAD

WILMINGTON, MA 01887

Proj. ID:

Lab Number: WQ1223-3
SDG: WQ1223
Report Date: 5/11/00
PO No. : 05.03.00
Project: WOBURN GW TREATMENT S
% Solids: N/A
Method: EPA 524.2
Date Analyzed: 5/9/00

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
S6	AQ	5/2/00	5/3/00	5/9/00	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
DICHLORODIFLUOROMETHANE	<1	ug/L	1.0	1	1
CHLOROMETHANE	<1	ug/L	1.0	1	1
VINYL CHLORIDE	<1	ug/L	1.0	1	1
BROMOMETHANE	<1	ug/L	1.0	1	1
CHLOROETHANE	<1	ug/L	1.0	1	1
TRICHLOROFLUOROMETHANE	<0.5	ug/L	1.0	0.5	0.5
1,1-DICHLOROETHENE	<0.5	ug/L	1.0	0.5	0.5
METHYLENE CHLORIDE	<2.5	ug/L	1.0	2.5	2.5
1,2-DICHLOROETHENE-(TRANS)	<0.5	ug/L	1.0	0.5	0.5
1,1-DICHLOROETHANE	0.8	ug/L	1.0	0.5	0.5
1,2-DICHLOROETHENE (CIS)	<0.5	ug/L	1.0	0.5	0.5
2,2-DICHLOROPROPANE	<0.5	ug/L	1.0	0.5	0.5
CHLOROFORM	0.7	ug/L	1.0	0.5	0.5
BROMOCHLOROMETHANE	<0.5	ug/L	1.0	0.5	0.5
1,1,1-TRICHLOROETHANE	4	ug/L	1.0	0.5	0.5
1,2-DICHLOROETHANE	<0.5	ug/L	1.0	0.5	0.5
1,1-DICHLOROPROPENE	<0.5	ug/L	1.0	0.5	0.5
CARBON TETRACHLORIDE	<0.5	ug/L	1.0	0.5	0.5
BENZENE	<0.5	ug/L	1.0	0.5	0.5
1,2-DICHLOROPROPANE	<0.5	ug/L	1.0	0.5	0.5
TRICHLOROETHENE	<0.5	ug/L	1.0	0.5	0.5
DIBROMOMETHANE	<0.5	ug/L	1.0	0.5	0.5
BROMODICHLOROMETHANE	<0.5	ug/L	1.0	0.5	0.5
CIS-1,3-DICHLOROPROPENE	<0.5	ug/L	1.0	0.5	0.5
TOLUENE	<1	ug/L	1.0	1.0	1.0
TRANS-1,3-DICHLOROPROPENE	<0.5	ug/L	1.0	0.5	0.5
1,1,2-TRICHLOROETHANE	<0.5	ug/L	1.0	0.5	0.5
1,3-DICHLOROPROPANE	<0.5	ug/L	1.0	0.5	0.5
DIBROMOCHLOROMETHANE	<0.5	ug/L	1.0	0.5	0.5
TETRACHLOROETHENE	<0.5	ug/L	1.0	0.5	0.5
1,2-DIBROMOETHANE	<0.5	ug/L	1.0	0.5	0.5
CHLOROBENZENE	<0.5	ug/L	1.0	0.5	0.5
1,1,1,2-TETRACHLOROETHANE	<0.5	ug/L	1.0	0.5	0.5

Report Notes:

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: BRIAN KEEGAN
UNIFIRST CORPORATION
68 JONSPIN ROAD

WILMINGTON, MA 01887

Proj. ID:

Lab Number: WQ1223-3
SDG: WQ1223
Report Date: 5/11/00
PO No. : 05.03.00
Project: WOBURN GW TREATMENT S
% Solids: N/A
Method: EPA 524.2
Date Analyzed: 5/9/00

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
S6	AQ	5/2/00	5/3/00	5/9/00	KMC	5030	KMC

Compound	Result	Units	DF	Sample PQL	Method PQL
ETHYLBENZENE	<0.5	ug/L	1.0	0.5	0.5
M+P-XYLENE	<1	ug/L	1.0	1.0	1.0
BROMOFORM	<0.5	ug/L	1.0	0.5	0.5
O-XYLENE	<0.5	ug/L	1.0	0.5	0.5
STYRENE	<0.5	ug/L	1.0	0.5	0.5
1,1,2,2-TETRACHLOROETHANE	<0.5	ug/L	1.0	0.5	0.5
1,2,3-TRICHLOROPROPANE	<0.5	ug/L	1.0	0.5	0.5
ISOPROPYLBENZENE	<0.5	ug/L	1.0	0.5	0.5
BROMOBENZENE	<0.5	ug/L	1.0	0.5	0.5
2-CHLOROTOLUENE	<0.5	ug/L	1.0	0.5	0.5
N-PROPYLBENZENE	<0.5	ug/L	1.0	0.5	0.5
4-CHLOROTOLUENE	<0.5	ug/L	1.0	0.5	0.5
1,3,5-TRIMETHYLBENZENE	<0.5	ug/L	1.0	0.5	0.5
TERT-BUTYLBENZENE	<0.5	ug/L	1.0	0.5	0.5
1,2,4-TRICHLOROBENZENE	<0.5	ug/L	1.0	0.5	0.5
SEC-BUTYLBENZENE	<0.5	ug/L	1.0	0.5	0.5
1,3-DICHLOROBENZENE	<0.5	ug/L	1.0	0.5	0.5
P-ISOPROPYLTOLUENE	<0.5	ug/L	1.0	0.5	0.5
1,4-DICHLOROBENZENE	<0.5	ug/L	1.0	0.5	0.5
1,2-DICHLOROBENZENE	<0.5	ug/L	1.0	0.5	0.5
N-BUTYLBENZENE	<0.5	ug/L	1.0	0.5	0.5
1,2-DIBROMO-3-CHLOROPROPAN	<5	ug/L	1.0	5	5
1,2,4-TRIMETHYLBENZENE	<0.5	ug/L	1.0	0.5	0.5
NAPHTHALENE	<1	ug/L	1.0	1.0	1.0
HEXACHLOROBUTADIENE	<0.5	ug/L	1.0	0.5	0.5
1,2,3-TRICHLOROBENZENE	<1	ug/L	1.0	1.0	1.0
4-BROMOFLUOROBENZENE	94	%	1.0		
1,2-DICHLOROBENZENE-D4	88	%	1.0		

Report Notes:

Katahdin Analytical Services, Inc.

REPORT OF ANALYTICAL RESULTS

Client: BRIAN KEEGAN
UNIFIRST CORPORATION
68 JONSPIN ROAD
WILMINGTON, MA 01887

Lab Sample ID: WQ1223-3
SDG: WQ1223
Report Date: 05/10/2000
PO No.: 05.03.00
Project: WOBURN GW TREATMENT SYSTEM
Percent Solids: N/A
Analytical Method: SW846 8082

Sample Description	Matrix	Date Sampled	Date Received	Date Prepped	Prep Chemist	Preparative Method
S6	Aqueous	05/02/2000	05/03/2000	05/05/2000	DS	SW846 3520

Analyte	Qualifier	Result	Units	DF	Sample PQL	Method PQL	Date Analyzed	Analyst
PCB-1016		< 0.50	ug/L	1.0	0.50	0.50	05/10/2000	JEY
PCB-1221		< 0.50	ug/L	1.0	0.50	0.50	05/10/2000	JEY
PCB-1232		< 0.50	ug/L	1.0	0.50	0.50	05/10/2000	JEY
PCB-1242		< 0.50	ug/L	1.0	0.50	0.50	05/10/2000	JEY
PCB-1248		< 0.50	ug/L	1.0	0.50	0.50	05/10/2000	JEY
PCB-1254		< 0.50	ug/L	1.0	0.50	0.50	05/10/2000	JEY
PCB-1260		< 0.50	ug/L	1.0	0.50	0.50	05/10/2000	JEY
2,4,5,6-Tetrachloro-meta-xylene		75	%	1.0			05/10/2000	JEY
Decachlorobiphenyl		78	%	1.0			05/10/2000	JEY

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: BRIAN KEEGAN
UNIFIRST CORPORATION
68 JONSPIN ROAD

WILMINGTON, MA 01887

Proj. ID:

Lab Number: WQ1223-3
SDG: WQ1223
Report Date: 5/30/00
PO No. : 05.03.00
Project: WOBURN GW TREATMENT S
% Solids: N/A
Method: EPA 8270B
Date Analyzed: 5/11/00

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
S6	AQ	5/2/00	5/3/00	5/4/2000	DS	SW3520	JG

Compound	Result	Units	DF	Sample PQL	Method PQL
PHENOL	<10	ug/L	1.0	10	10
BIS(2-CHLOROETHYL)ETHER	<10	ug/L	1.0	10	10
2-CHLOROPHENOL	<10	ug/L	1.0	10	10
1,3-DICHLOROBENZENE	<10	ug/L	1.0	10	10
1,4-DICHLOROBENZENE	<10	ug/L	1.0	10	10
1,2-DICHLOROBENZENE	<10	ug/L	1.0	10	10
2-METHYLPHENOL	<10	ug/L	1.0	10	10
2,2'-OXYBIS(1-CHLOROPROPANE)	<10	ug/L	1.0	10	10
4-METHYLPHENOL	<10	ug/L	1.0	10	10
N-NITROSODI-N-PROPYLAMINE	<10	ug/L	1.0	10	10
HEXACHLOROETHANE	<10	ug/L	1.0	10	10
NITROBENZENE	<10	ug/L	1.0	10	10
ISOPHORONE	<10	ug/L	1.0	10	10
2-NITROPHENOL	<10	ug/L	1.0	10	10
2,4-DIMETHYLPHENOL	<10	ug/L	1.0	10	10
BIS(2-CHLOROETHOXY)METHANE	<10	ug/L	1.0	10	10
2,4-DICHLOROPHENOL	<10	ug/L	1.0	10	10
1,2,4-TRICHLOROBENZENE	<10	ug/L	1.0	10	10
NAPHTHALENE	<10	ug/L	1.0	10	10
4-CHLOROANILINE	<10	ug/L	1.0	10	10
HEXACHLOROBUTADIENE	<10	ug/L	1.0	10	10
4-CHLORO-3-METHYLPHENOL	<10	ug/L	1.0	10	10
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10
HEXACHLOROCYCLOPENTADIEN	<10	ug/L	1.0	10	10
2,4,6-TRICHLOROPHENOL	<10	ug/L	1.0	10	10
2,4,5-TRICHLOROPHENOL	<25	ug/L	1.0	25	25
2-CHLORONAPHTHALENE	<10	ug/L	1.0	10	10
2-NITROANILINE	<25	ug/L	1.0	25	25
DIMETHYL PHTHALATE	<10	ug/L	1.0	10	10
ACENAPHTHYLENE	<10	ug/L	1.0	10	10
2,6-DINITROTOLUENE	<10	ug/L	1.0	10	10
3-NITROANILINE	<25	ug/L	1.0	25	25
ACENAPHTHENE	<10	ug/L	1.0	10	10

Report Notes: #

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: BRIAN KEEGAN
UNIFIRST CORPORATION
68 JONSPIN ROAD

WILMINGTON, MA 01887

Proj. ID:

Lab Number: WQ1223-3
SDG: WQ1223
Report Date: 5/30/00
PO No. : 05.03.00
Project: WOBURN GW TREATMENT S
% Solids: N/A
Method: EPA 8270B
Date Analyzed: 5/11/00

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
S6	AQ	5/2/00	5/3/00	5/4/2000	DS	SW3520	JG

Compound	Result	Units	DF	Sample PQL	Method PQL
2,4-DINITROPHENOL	<25	ug/L	1.0	25	25
4-NITROPHENOL	<25	ug/L	1.0	25	25
DIBENZOFURAN	<10	ug/L	1.0	10	10
2,4-DINITROTOLUENE	<10	ug/L	1.0	10	10
DIETHYLPHTHALATE	<10	ug/L	1.0	10	10
4-CHLOROPHENYL-PHENYLETHE	<10	ug/L	1.0	10	10
FLUORENE	<10	ug/L	1.0	10	10
4-NITROANILINE	<25	ug/L	1.0	25	25
4,6-DINITRO-2-METHYLPHENOL	<25	ug/L	1.0	25	25
N-NITROSODIPHENYLAMINE	<10	ug/L	1.0	10	10
4-BROMOPHENYL-PHENYLETHER	<10	ug/L	1.0	10	10
HEXACHLOROBENZENE	<10	ug/L	1.0	10	10
PENTACHLOROPHENOL	<25	ug/L	1.0	25	25
PHENANTHRENE	<10	ug/L	1.0	10	10
ANTHRACENE	<10	ug/L	1.0	10	10
CARBAZOLE	<10	ug/L	1.0	10	10
DI-N-BUTYLPHTHALATE	<10	ug/L	1.0	10	10
FLUORANTHENE	<10	ug/L	1.0	10	10
PYRENE	<10	ug/L	1.0	10	10
BUTYLBENZYLPHTHALATE	<10	ug/L	1.0	10	10
3,3'-DICHLOROBENZIDINE	<10	ug/L	1.0	10	10
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10
CHRYSENE	<10	ug/L	1.0	10	10
BIS(2-ETHYLHEXYL)PHTHALATE	<10	ug/L	1.0	10	10
DI-N-OCTYLPHTHALATE	<10	ug/L	1.0	10	10
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10
BENZO[A]PYRENE	<10	ug/L	1.0	10	10
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10
2-FLUOROPHENOL	#0	%	1.0		
PHENOL-D6	#0	%	1.0		

Report Notes: #

KATAHDIN ANALYTICAL SERVICES
REPORT OF ANALYTICAL RESULTS

Client: BRIAN KEEGAN
UNIFIRST CORPORATION
68 JONSPIN ROAD

WILMINGTON, MA 01887

Proj. ID:

Lab Number: WQ1223-3
SDG: WQ1223
Report Date: 5/30/00
PO No. : 05.03.00
Project: WOBURN GW TREATMENT S
% Solids: N/A
Method: EPA 8270B
Date Analyzed: 5/11/00

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
S6	AQ	5/2/00	5/3/00	5/4/2000	DS	SW3520	JG

Compound	Result	Units	DF	Sample PQL	Method PQL
NITROBENZENE-D5	#0	%	1.0		
2-FLUOROBIPHENYL	#0	%	1.0		
2,4,6-TRIBROMOPHENOL	#0	%	1.0		
TERPHENYL-D14	#0	%	1.0		

Report Notes: #

Appendix H

UV/Ox Field Parameter Measurements

UV Effluent Data - Year 8

Date	Temperature (F)	Hydrogen Peroxide Concentration (ppm)
10/5/99	58	10
10/12/99	56	10
10/19/99	56	10
10/26/99	58	10
11/2/99	56	10
11/8/99	56	15
11/17/99	58	12
11/23/99	56	12
11/30/99	58	12
12/7/99	58	10
12/15/99	58	15
12/21/99	58	10
12/29/99	58	6
1/5/00	58	10
1/11/00	57	8
1/18/00	57	7
1/26/00	57	7
2/1/00	57	9
2/8/00	57	7
2/15/00	57	0
2/22/00	57	6
2/28/00	57	
3/7/00	57	8
3/14/00	57	8
3/21/00	57	8
3/28/00	57	10
4/4/00	57	8
4/11/00	57	10
4/18/00	57	8

Date	Temperature (F)	Hydrogen Peroxide Concentration (ppm)
4/25/00	57	8
5/4/00	57	8
5/9/00	57	8
5/16/00	57	8
5/23/00	57	8
5/30/00	57	8
6/6/00	57	8
6/13/00	57	8
6/20/00	57	8
6/27/00	57	8
7/5/00	57	8
7/14/00	57	8
7/18/00	57	8
7/25/00	57	8
8/1/00	57	8
8/8/00	58	10
8/15/00	57	8
8/22/00	58	8
8/29/00	58	8
9/5/00	58	8
9/12/00	58	8
9/20/00	58	8
9/27/00	58	8

Appendix I

Contaminant Mass Removal Table

Contaminant Mass Removal
UniFirst Treatment System
Year 8

Date	Influent Concentration (µg/L) 1,1,1-TCA	1,1-DCE	1,2-DCE	PCE	TCE	Flow (gallons)	Calculated Removal (pounds) 1,1,1-TCA	1,1-DCE	1,2-DCE	PCE	TCE
Oct-99	*4*	*1*	*1*	*570*	*33*	1,620,000	0.05	0.01	0.01	7.70	0.45
Nov-99	4	1	1	650	38	1,580,000	0.05	0.01	0.01	8.56	0.50
Dec-99	*4.5*	*1*	*1*	*695*	*37*	1,640,000	0.06	0.01	0.01	9.50	0.51
Jan-00	5	1	1	740	36	1,640,000	0.07	0.01	0.01	10.12	0.49
Feb-00	*5*	*1*	*1*	*725*	*31*	1,530,000	0.06	0.01	0.01	9.25	0.40
Mar-00	5	1	1	710	26	1,750,000	0.07	0.01	0.01	10.36	0.38
Apr-00	*4.5*	*1*	*1*	*675*	*20.5*	1,710,000	0.06	0.01	0.01	9.62	0.29
May-00	4	1	1	640	15	1,760,000	0.06	0.01	0.01	9.39	0.22
Jun-00	*4*	*1*	*2.5*	*605*	*21.5*	1,720,000	0.06	0.01	0.04	8.67	0.31
Jul-00	4	1	4	570	28	1,750,000	0.06	0.01	0.06	8.31	0.41
Aug-00	*3.5*	*1*	*2.5*	*510*	*24*	1,710,000	0.05	0.01	0.04	7.27	0.34
Sep-00	3	1	1	450	20	1,635,000	0.04	0.01	0.01	6.13	0.27
Year 8 Totals						**20,045,000**	**0.70**	**0.17**	**0.25**	**104.87**	**4.56**

Concentrations in italics were calculated average from previous & following month

Concentrations below detection limit were given a value of 1 µg/L

Previous Years

Year 7						19,970,000	0.69	0.16	0.31	131.74	6.12
Year 6						20,900,000	0.23	0.45	0.35	124.71	5.39
Year 5						21,700,000	0.70	0.20	0.50	142.50	5.81
Year 4						22,620,000	1.20	0.00	0.10	171.10	8.76
Year 3						22,540,000	0.00	0.00	0.00	224.33	10.28
Year 2						22,480,000	0.00	0.00	0.00	304.41	12.83
Year 1						24,280,000	0.00	0.00	0.00	331.78	19.34
Cumulative Total (Years 1 through 8)						**174,535,000**	**3.52**	**0.98**	**1.51**	**1535.44**	**73.09**